

Research Report 1315

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EVALUATING THE EFFECTIVENESS OF SOLDIER'S MANUALS: A FIELD STUDY

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TRAINING TECHNICAL AREA



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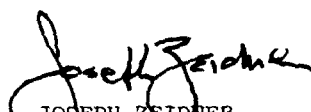
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FOREWORD

The mission of the Training Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) is to provide research support to Army training programs. A major focus of this research is to develop fundamental data and technology necessary to field integrated training systems for improving individual job performance. Such systems include Skill Qualifications Tests (SQT), job performance aids, training courses in schools and the field, performance criteria, and management and feedback systems. This report is one of a series of research on the factors which relate to SQT performance. This research program will develop criteria for increasing the effectiveness of SQTs for assessing and ultimately improving individual job performance. This work is in response to requirements of the Army Training Support Center (ATSC) of the Army Training and Doctrine Command (TRADOC). This research was accomplished under Army Project 2Q763731A770, FY 78. Personnel of ARI and the American Institutes for Research under Contract MDA903-78-C-2033 performed this research.


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Finally, appreciation is extended to the many individuals at the various sites visited who completed questionnaires and submitted to lengthy interviews. Our sincere thanks to them.

Harris H. Shettel

Project Director

BRIEF

Requirement:

To determine to what extent the Soldier's Manual (SM) is being used by personnel in the field and whether such use is contributing to job skill proficiency.

Procedure:

Questionnaires were administered to 1,224 soldiers in eight Combat Arms and seventeen Combat Support MOS. In addition, individual interviews were held with senior enlisted (N=141) and officer (N=56) personnel. Finally, scores were obtained for all those in the sample who had taken the SQT. Data were collected at three CONUS and nine USAREUR sites in 1979. Information was obtained on characteristics of: (a) the SM user, (b) the training environment, and (c) the SM document itself. These data were related to patterns of SM usage, which was in turn related to level of individual job performance as indicated by SQT scores.

Findings:

Major findings are as follows:

1. General SM usage is high (82% of sample used it at least once);
2. Combat Arms personnel tend to use the SM more than Combat Support personnel; USAREUR more than CONUS.
3. SM usage increases with rank and years of Army experience.
4. SM usage is driven largely by the need to study for the SQT.
5. Higher levels of support of the SM concept by senior level personnel is associated with higher levels of usage by lower level personnel.
6. The SM document itself is not able to withstand hard physical use.

7. A high percentage of SM users report that tasks in the SM differ from the way they are done on the actual job (73%), do not tell what is needed to do the job (39%), and contain one or more technical errors (42%). Lack of job relevance is more evident in the Combat Support MOS than in the Combat MOS.
8. There is a small but statistically significant positive correlation between the extent of SM usage and scores on the SQT.

Utilization of Findings:

Specific recommendations have been made in writing to Fort Eustis and to all Proponent Schools, based on the above findings. They include ways to improve the physical characteristics of the SM, the climate of support of the SM, and the accuracy and completeness of the contents of the SM.

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I. INTRODUCTION

The point has been made that military personnel have two essential kinds of roles to perform: (1) operational missions, and (2) preparing for and maintaining readiness to carry out operational missions. While there are a variety of ways to approach and maintain combat readiness, they tend to cluster in two areas. There is school-based, institutional, or resident training, estimated to account for about 40 percent of relevant knowledge and skills. The remaining 60% is made available through individual and collective training that occurs in the unit.

Skill building and skill maintenance are particular challenges in combat arms, combat support, and combat service support units because it is more difficult to control the conditions necessary for systematic and orderly training and testing (as contrasted, for example, with the more formal and controlled setting of resident training and testing). Nevertheless, in the last analysis it is the ability of the individual soldier in the field to perform all of his or her critical job tasks that is the ultimate criterion of a combat ready force.

Within this context, the Soldier's Manual (SM) has been designed to play a central role. It represents a key element in the performance-based training, testing, and skill level advancement process that is the core of the Army's Enlisted Personnel Management System (EPMS). Two central features of this system are the careful and precise definition of soldier jobs (duty positions) within a Military Occupational Speciality (MOS), and the provision of documents (e.g., the Soldier's Manuals) designed for use in training and evaluating individual soldier performance. The basic element in this systematic approach to individual job proficiency is the task. Based on job and task analyses, tasks are defined in detail and form the basis for the Individual Training Plan (ITP). In effect, the ITP lists all the tasks in an MOS, with conditions and standards for their successful completion, and indicates the training setting in which each one is to be mastered. Those critical tasks that are to be learned and maintained in the units through on-the-job experience or on-the-job training are candidates for inclusion in the SM. The following general description of the SM is taken from Chapter 3, paragraph 3-1a of TRADOC Circular 351-28 (dated 4 December 1978):

Every soldier should have one up-to-date manual that describes in detail the tasks that are critical to survival and successful mission performance on the modern battlefield. The Soldier's Manual is intended to be a well-illustrated one-step training and

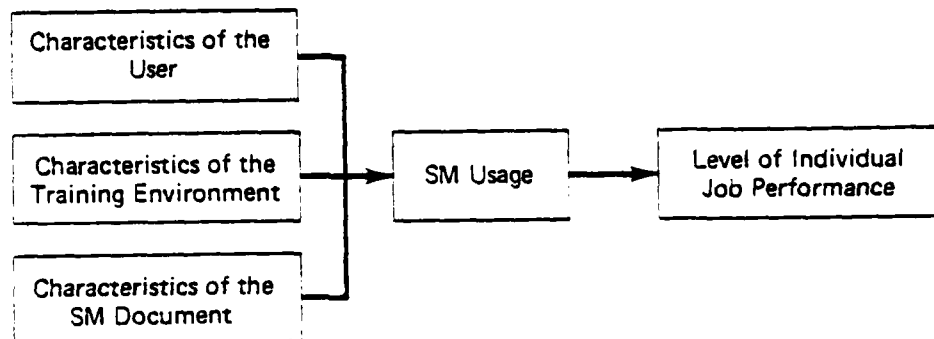
evaluation guide. The tasks are listed by skill level and duty position for each MOS, and contain prescribed performance measures, conditions and standards. The Soldier's Manual tells the soldier, in precise terms, what the Army expects him to master to be proficient in his job. This manual informs his supervisor and commander of those tasks that they can expect him to be able to do and provides suggestions and references to aid them in training the soldier. The manual is both a training document, in that it tells the soldier how to do the tasks, and a testing document, in that it is the basis for the SQT.

To carry out its role as the key resource document in this skill and knowledge maintenance and building process, it is clear that the SM must: (1) be used as intended and by whom intended; (2) be accurate and comprehensive in its coverage of the relevant (critical) tasks; and (3) be understandable to the user. If all of these conditions are met, then the existence of the SM should have a measurable and significant impact on the ability of the individual soldier to perform at his or her correct skill level and should provide the basis for advancement to higher skill levels through the SQT system. Since the introduction of SMs is a fairly recent event (they first appeared in 1976), and in view of their important and central role in individual job training, it is most appropriate to try to assess the extent to which they are, in fact, fulfilling that role. This is the purpose of the study being described here.

The issues addressed in this report concern how SMs are currently being used in the field,* the nature of the factors that influence their use or disuse, and the degree to which patterns of use relate to job skills. The systematic elaboration of these issues is intended to lead to the development of guidelines that address, in a constructive and practical way, those things that can be done to enhance the use and effectiveness of the SMs. Thus, the research reported herein is part of an orderly change process, leading to a series of pragmatic outcomes that are intended to increase the value of SMs to the Army.

*The data for this study were collected during the first half of 1979. A more recent study on SM usage was carried out in late 1980 by ARI and is briefly reported on in an addendum to this report (page 127).

To guide the research the model shown below was developed:



The basic thesis of the model is that an understanding of the use and effectiveness of the SM itself can only be achieved in the context of the system within which it is used. User characteristics include all those variables idiosyncratic to the individual user that may have an impact on usage. They include demographic information, training history, MOS, skill level, duty assignment, and feelings and attitudes about the Army. Each of the areas included in this user characteristics category can be hypothesized to exert some influence on the use of individual job training materials, of which the SM is a part. One cannot predict in advance, of course, which will be significant or whether or not any of them will be significant.

Training environment characteristics include both the unit a soldier is in and the EPMS in general. The EPMS has been designed to work in a particular way in terms of process, materials, and people. Certain things (e.g., SQT Notices) are supposed to be used in certain ways (e.g., sent to certain people who are supposed to read and use them), according to an established schedule (e.g., the Notice should arrive X days before the SQT is given). This total plan for the use of SMs, SQT Notices, and SQTs is one "environment" that can be expected to influence the job incumbent in terms of his or her actual use (or non-use) of the materials. The study, therefore, needs to know how this system is being implemented within the unit being examined. Such information would be of interest not only to help explain how the individual job incumbent is using the system (and the SM), but also how the senior level personnel are using it, and their support or non-support of its use.

The rationale for knowing something about the unit to which the job incumbents and senior level personnel are assigned is quite similar to the rationale for knowing about the EPMS characteristics. The kinds of things at the unit level that might be expected to influence SM usage and effectiveness are the "climate" of attitudes toward individual training in the unit, the nature of the formal and informal training activities carried out and planned for in the unit, and the availability of equipment and documentation for training.

The SM itself is obviously an important part of the picture. This area of inquiry looks specifically at those characteristics of the document that may be expected to influence its use. This would include its perceived completeness, accuracy, comprehensibility, and ease of use. Both job incumbents and senior level personnel would be expected to have useful things to say about this factor.

The usage factor is critical to the two major questions addressed by the study. On the one hand, it provides the criterion or dependent measure for one study question ("What factors influence SM usage?"); and on the other hand, it provides the independent measure for the second study question ("How does SM usage influence job performance?"). Therefore, a detailed history of when, why, and under what conditions the SM was and is being used needs to be obtained. Reasons for non-use need to be explored.

The final component of the model is the relationship between SM usage factors and individual job performance. Since data on actual job performance are not available, one must rely on surrogate measures. One of them, SQT scores, is (or should be) a very good surrogate since the SQT test is either a sample of actual job performance tasks or is performance based. When SQT scores are not available, another surrogate for job performance is the self-rating of job incumbents on their ability to perform the tasks in their primary MOS and at their appropriate skill level.

The overall rationale, in broad perspective, can now be seen, as well as the four factors about which it is necessary to obtain information in order to answer the study questions.

The system shown in the model has certain feedback characteristics that could be expected to influence the use of the SM. For example, one's perception of one's job performance probably has an influence on SM use or non use. That perception could in turn influence the training environment in which the soldier exists and his own opinion and attitude toward the usefulness of the SM itself. The SQT provides a concrete channel for this kind of feedback because the score on the SQT "tells" the soldier something about his or her SM experience (or non-experience) and "tells" the unit something about its individual training experience. Thus, we have a system in which

results (perceived or real, positive or negative) may have an impact on the usage of the document that is itself an influence on results.

In addition, there are factors at both the unit and individual level that may influence job performance independently of how SMs are use. Such influences may mask or, in extreme cases, even act to countervene effects on performance associated with SM use per se. In short, there is not a simple linear relationship among the factors in the model.

This report, which describes the data collection procedure and the details of the ensuing analyses, is organized into seven chapters. A description of the research method, the data collection instruments used, and of the soldiers who participated in the survey is given in Chapter II. Chapter III discusses characteristics of the SM document that may influence its use as measured directly and as perceived by the survey sample. Patterns of SM usage and factors appearing to influence use are discussed in Chapter IV. In Chapter V, the relationship between SM usage and performance is explored. Chapter VI contains a discussion of the more qualitative aspects of the study and presents findings from the senior-level interviews and the critical incidents collected from soldiers. Finally, Chapter VII presents guidelines and recommendations that have been developed to translate study findings into specific actions to improve SM acceptance, usage, and effectiveness.

II. STUDY DESIGN AND PROCEDURES

METHOD

Development of Survey Instruments

The first step in the design of this study was to give substance to the concepts and rationale represented in the model presented in the previous chapter. The five structural components of the model (user characteristics, training environment, SM document characteristics, SM usage, and performance level) defined the areas of inquiry, while the functional components (the arrows) in a general sense determined the analyses conducted. Also, the general survey design (e.g., expected numbers of subjects, time restrictions for individual soldiers, available staff, etc.) had an impact upon the development of information requirements and data collection instruments.

These latter considerations were, in part, specified prior to the initiation of the project. The initial study design called for the collection of data from approximately 25 different MOSs (selected because both the SMs and SQTs for them had been fielded and because they were of relatively high density); this number was selected as a compromise between an exhaustive survey of all SMs and an intensive examination of a few SMs. Furthermore, the initial plan called for an examination of three Skill Levels within each MOS; this was built into the design because in most cases the SMs for Skill Levels 1/2, 3, and 4 contain different tasks. Also, the initial plan called for the collection of information from approximately 25 job incumbents at each Skill Level in each MOS. Finally, the general restriction of limiting the data collection period for each soldier to one hour was imposed.

Given the above parameters and projected staff resources, it was agreed that the major form of data collection would be a questionnaire, suitable for administration to small groups of soldiers and that could be completed with minimal supervision in approximately one hour. Also, provisions were made to allow for the individual interviewing of a subsample of approximately 400 soldiers. These interviews were designed to serve two purposes: first, to collect more detailed information concerning data items which, due to the adoption of a questionnaire format for the majority of the soldiers, would of necessity have limited response alternatives; and second, to collect additional, more qualitative information not suitable for a questionnaire format. Finally, provisions were also made to allow for interviewing approximately 200 senior-level personnel. It was decided that this group (which would include training managers, platoon leaders, officers with administrative responsibility, etc.) would provide both an additional perspective on the areas of inquiry

presented in the model and additional specific information that job incumbents would not possess.

Decisions as to specific items to be included in the questionnaire, soldier interview, and senior interview, were made iteratively among AIR, ARI, and the military sponsor at Fort Eustis. It was agreed that the same items would be included for all of the MOSs and Skill Levels sampled. It was also agreed that all items in the questionnaire would be included in the soldier interview instruments. However, several additional items were generated specifically for soldier interviews. A separate set of items was developed for the senior interview form; again, these items would be the same for all senior personnel, regardless of their position.

All items and forms developed were field tested at Fort Knox prior to actual data collection. This field test was designed to provide information on the adequacy of the materials in terms of format, timing, administrative feasibility, comprehensibility of items and instructions, and scoring ease and accuracy. The field test involved 23 job incumbents and four senior-level personnel. Based on this test, additional revisions were made in the materials, and a final version of each form was developed.

The following section briefly describes the content of the data collection instruments. Rationales for the inclusion of specific items will not be presented except in cases where some special formats were used. In general, however, the basis for inclusion of each particular item was its hypothetical relationship to SM usage and effectiveness. Several items were included for each of the areas of inquiry described above; in fact, there were several redundant items (asking the same essential question in different ways) which were eventually examined as an indicator of internal consistency and reliability. Complete copies of the four data collection instruments (questionnaire, soldier interview, senior interview, and confidence ratings) are included in Appendix A.

- The General Survey Questionnaire was designed to be filled in by all job incumbents. This 20-page form consists of 59 separate questions, divided among major topic areas. These areas are:
 1. Background characteristics of each soldier, including information about his or her personal background, Army work and training experience, and attitudes. In order to determine efficiently where each soldier was with regard to the SQT cycle, a "timeline" item was included. This item graphically portrays a two-year period; soldiers were asked to indicate when several SM-related and SQT-related events occurred (e.g., when the SQT was taken, when the SM and SQT Notice were received, when training for the SQT took place, etc.).

Another "unique" item is a Training Resources checklist. Soldiers were shown several resources that could be used for training, such as TMs, SMS, Training Circulars, and TEC lessons. Soldiers indicated which of these resources had been used for SQT preparation or for other reasons. This item was included as an efficient way to collect indicators of each soldier's Army and training experience.

2. Physical characteristics of Soldier's Manuals, including a variety of possible problems soldiers experience when using them.
 3. Characteristics of the ways in which each soldier uses the SM, including information concerning the role of the SM in preparing for an SQT.
- Special Interview Forms were designed to be completed by project staff during individual interviews with soldiers. There are two parts to this interview form (in addition to all the items in the General Survey Questionnaire):
 1. A series of four questions aimed at assessing the individual soldier's knowledge about the Enlisted Personnel Management System (EPMS). Soldiers were asked basically to describe their career plans and in general to describe what they knew about the EPMS in terms of requirements for career progression.
 2. A "Critical Incident" form, filled out by the interviewer, that was designed to obtain information regarding specific events or incidents that the soldier could recall which "had something to do with the effective or ineffective use of the SM." This Critical Incident Technique has been demonstrated to be a potentially powerful tool for the analysis of qualitative data. In addition to constituting a pool of "case studies" of SM use, Critical Incident data can be analyzed quantitatively. For example, the proportions of positive and negative instances can be determined, different classificatory systems can be used to determine categories of SM use, and frequent or recurrent patterns of SM use can be discriminated.
 - Senior-Level Interview Forms were designed to be completed by project staff during interviews with Army supervisory personnel. This 13-page protocol served as a general guide for the interviews, and specified several topics for discussion. These topics include issues of Unit Training and resources, Individual Job Training (IJT), SQT administration, and the interviewee's perceptions and attitudes regarding SMs. In essence, these senior interviews were intended to be a qualitatively different data base than that developed

from the soldiers. It was expected that these senior-level personnel would be able to provide unanticipated information and suggestions regarding SM usage and effectiveness. Therefore, the Senior-Level Interview Form contains mostly open-ended questions designed to initiate more extended discussions.

- Confidence Rating Forms were designed to be completed by all soldiers (whether or not they were interviewed). These forms contain task lists taken from the SQT Notices for each MOS and Skill Level represented in the sample of soldiers participating in this study. Soldiers were required to answer three questions for each task, regarding whether they had ever been trained for the task, had ever performed the task, and how confident they were of their ability to perform it.

Data Collection Procedures

Data were collected from three CONUS sites (Forts Stewart, Bragg, and Campbell) and nine USAREUR* sites in Germany during the following time periods (all in 1979):

Jan. 15-19; April 30-May 9	Stewart
Feb. 5-9 ; March 19-21	Bragg
Feb. 19-March 14	USAREUR
April 9-13; June 4-8	Campbell

Personnel requirements (soldiers, senior-level personnel, support personnel) were coordinated with Army representatives at each site prior to actual visits. While project staff specified requirements by MOS and Skill Level, actual selection of respondents was usually made at the Unit level. In making requests for support, it was suggested that participants should have taken, or would soon be taking, their SQTs. Also, Els and E2s should not be included, and all soldiers should intend to reenlist. These suggestions were made to increase the probability of obtaining useful information about SM usage and effectiveness from the soldiers. In fact, several Els and E2s, and a large number of soldiers not planning to reenlist were included in the survey. Since it soon became apparent that the actual samples being obtained were not meeting original goals, all these soldiers were included in the data base. Post-hoc comparisons revealed that these soldiers did not differ in any important respect from the rest of the sample; thus, their inclusion served to increase the obtained sample size without biasing the results.

*The primary reason for visiting nine separate USAREUR sites was the recognition on the part of project staff that it would be impossible to complete the subject requirements at only one or two sites. Thus, the strategy evolved to visit sites wherever and whenever appropriate soldiers were presumed to be available.

Questionnaire administration procedures. Actual data collection for the soldiers who completed the questionnaire took place in small groups (usually three to twelve soldiers per group). At the start of each session, soldiers read and signed a Privacy Act Statement. The project staff member conducting the session then read aloud a brief introduction to the survey and the project. Soldiers then completed their questionnaires at their own pace; staff members circulated among the group, monitoring progress through the form and answering any questions. Occasionally, it was necessary to "walk through" the form (i.e., read questions aloud and illustrate how to record responses on the form) or actually to fill out a form for a soldier who was having difficulty in understanding the written questions. When each soldier completed the questionnaire, a project staff member briefly checked the form for omissions and inconsistencies, and obtained the necessary missing information. Each soldier was given an appropriate Confidence Rating Form and instructed how to use it. Soldiers completed this form by themselves; again, project staff answered any questions soldiers had. When this form was completed, it was checked by staff for omissions and required information was obtained.

Soldier Interview procedures. Soldiers in the interview group followed the same general sequence of activities as those in the Questionnaire group. The basic differences were that, first, all questions in the survey were read to each soldier; second, each soldier was encouraged to elaborate upon the responses given; and third, the Special Interview Forms (EPMS Information and Critical Incidents) were also administered. Thus, information collected from this group included responses to all the items in the Questionnaire and the Confidence Rating Forms, plus the Special Interview Forms.*

Senior-Level Interview procedures. The data collection procedure followed a "structured interview" format. Interviewees were briefed more extensively as to project objectives, and the senior-level personnel were given an opportunity to state informally how they "fit into" the EPMS. They were also encouraged to elaborate their answers to any specific questions and were given the opportunity to "go beyond" the interview items to raise relevant issues which had not been included.

SQT Information

As part of this project, it was necessary to obtain actual SQT results for as many of the survey population as possible. Toward this end, contact was established with Fort Eustis, and input requirements were specified by Eustis personnel. In order to keep the scope of the tape searches necessary to obtain the data within feasible bounds, it was necessary to limit the search

*The responses to the Questionnaire and Confidence Rating Forms obtained from interviewed soldiers were treated exactly like the non-interviewed soldiers.

only to MOSs and Skill Levels expected from our sample.*

The information that was received consisted of the complete SQT record for each soldier for each SQT that he or she had taken. A "new" data base was created which abstracted and summarized relevant information from the total record. Essentially, this data base consisted of the actual number of tasks in the test; the number of tasks taken, passed, and failed for each test component (Written, Hands-on, and PCC); and an overall Raw Score.

BASIC DESCRIPTION OF THE DATA BASE

Sample Characteristics

Questionnaire and Soldier Interview data were collected from a total of 1,224 soldiers; 871 (71.2%) completed questionnaires only, while 353 (28.8%) were interviewed. As noted, these data were collected from three CONUS sites (Forts Campbell, Bragg, and Stewart) and nine USAREUR sites. Table II.1 shows the number of soldiers surveyed at each site.

For most of the analyses described in this report, the primary unit of analysis will be Military Occupational Specialty (MOS). The survey sample consisted of 25 MOSs, with frequencies for each as shown in Table II.2.

As can be seen, the original sampling plan was not realized. Although all of the original 25 MOSs were sampled, the desired sample size (approximately 75 per MOS) was not fulfilled. It is difficult to assess the effect of differential sampling for many of the analyses conducted; we do not know, for example, the specific selection procedures employed at the Units, nor do we know whether the pattern of low-frequency MOSs was systematically caused. However, we believe that for the purposes of this project, the obtained sample was entirely reasonable, both for analytic and interpretive purposes.

Another classification which will be maintained in subsequent sections is the organization of the MOSs into Proponent Schools. These are the organizations responsible for training, SM development, etc., for groups of MOSs. Table II.3 shows these Schools, locations, responsible MOSs, and frequency in the survey.

*Thus, we could have "missed" the SQT records for soldiers in the sample if: 1) they took an SQT and an MOS different from their current one; 2) they took an SQT prior to 1977; or 3) they took an SQT at a Skill Level more than two levels different from their current one.

Table II.1. Numbers of Soldiers Surveyed by Site

	Questionnaire N	Interview N	Total N	Percent of Total
CONUS	563	243	806	65.8
Stewart	199	77	276	22.5
Bragg	103	68	171	14.0
Campbell	261	98	359	29.3
<hr/>				
USAREUR	308	110	418	34.2
Wiesbaden	56	20	76	6.2
Baumhoelder	130	36	166	13.6
Wachernheim	47	11	58	4.7
Bad Kreuznach	33	19	52	4.2
Zweibruecken	8	4	12	1.0
Landstuhl	8	0	8	0.7
Pirmasens	3	1	4	0.3
Mannheim	21	10	31	2.5
Finthen	2	9	11	0.9
<hr/>				
TOTAL	871	353	1224	100.0

Table II.2 Numbers of Soldiers Surveyed by MOS¹

<u>MOS</u>	<u>Title</u>	<u>N</u>	<u>Percentage</u>
11B	Infantryman	78	6.4
11C	Indirect Fire Infantryman	83	6.8
19/11D	Armor Reconnaissance Specialist	40	3.3
19/11E	Armor Crewman	30	2.5
13B	Cannon Crewman	91	7.4
13E	Cannon Fire Direction Specialist	64	5.2
16P	Short-Range Air Defense Artillery Missile Crewman	66	5.4
16R	Short-Range Air Defense Artillery Crewman	95	7.8
45K	Tank Turret Repairman	31	2.5
45L	Artillery Repairman	13	1.1
57H	Terminal Operations Coordinator	32	2.6
63B	Wheel Vehicle Mechanic	51	4.2
63C	Track Vehicle Mechanic	38	3.1
63H	Automotive Repairman	51	4.2
64C	Motor Transport Operator	52	4.2
71P	Flight Operations Coordinator	42	3.4
74D	Computer/Machine Operator	26	2.1
74F	Programmer/Analyst	6	0.5
76J	Medical Supply Specialist	29	2.4
76P	Stock Control Supplyman	44	3.6
76Y	Unit and Organization Supplyman	61	5.0
93H	Air Traffic Control Tower Operator	42	3.4
93J	ATC Radar Controller	47	3.8
95B	Military Police	61	5.0
95C	Correctional Specialist	47	3.8
	Total	1220	

¹Four soldiers currently held MOSs not included in our survey. However, various parts of their data were used when appropriate (e.g., they used an SM which was in the sample).

Table II.3 Proponent Schools

<u>School</u>	<u>Location</u>	<u>Relevant MOS</u>	<u>N</u>	<u>Percentage</u>
Infantry	Ft. Benning	11B, 11C	161	13.2
Armor	Ft. Knox	19/11D, 19/11E	70	11.1
Artillery	Ft. Sill	13B, 13E	155	12.6
Air Defense	Ft. Bliss	16P, 16R	161	13.2
Ordnance	Aberdeen	45K, 45L, 63B, 63C, 63H	184	15.1
Transportation	Ft. Eustis	57H, 64C	84	6.8
Aviation	Ft. Rucker	71P, 93H, 93J	131	10.6
Admincen	Ft. Benjamin Harrison	74D, 74F	32	2.6
Health Science	Ft. Sam Houston	76J	29	2.4
Quartermaster	Ft. Lee	76P, 76Y	105	8.6
Military Police	Ft. McClellan	95B, 95C	108	8.8

Respondent Characteristics

This section will give an overview of the general characteristics of the soldiers involved in the survey and the types of information obtained. Detailed statistics will not be presented here; rather, these statistics will be presented where appropriate for particular analyses. While this survey was not specifically designed to be representative of the Army as a whole, these data can be used to make some rough comparisons, for example, among MOSs or against some known Army-wide values.

Table II.4 presents a variety of information regarding the soldiers' backgrounds, Army experiences, job experiences, and two basic descriptive variables: whether or not a soldier has an SM and whether or not he or she took the SQT.

The average age of the sample is roughly similar for all MOSs. However, it should be noted that these distributions are highly skewed, thereby inflating the mean. Median ages (not shown here) were approximately 1-2 years lower in each MOS. Most of the sample (91%) had completed a high school education or had some college education. With respect to Army experience, only 5% of the sample were of ranks E1 or E2, and only 1% were E7.* (As was mentioned previously, although an attempt was made to screen out E1s and E2s, they nonetheless did not differ in any meaningful way with respect to SM usage or with respect to any other central variables.)

Although there were some substantial differences among MOSs, most soldiers had been on active duty for approximately five years. (Again, these distributions are highly skewed; median time in service [not shown here] was approximately two years less for each MOS.) Soldiers were not asked directly whether they considered themselves as "lifers" or military-career oriented; nevertheless, most of the long-term soldiers were concentrated in the 74D, 74F, and 76P MOSs. Substantially longer than average careers were also reported for the 19E, 76Y, and 95C MOSs.

Job experience (Months in Current MOS) follows a similar pattern as Months on Active Duty. If Months in Current MOS can be interpreted as an indication of career orientation, it appears that 11B, 74D, and both Military Police MOSs (95B and 95C) contain higher than average proportions of job-directed soldiers. As a further indicant of career motivation, proportions of soldiers who were planning to reenlist also roughly track the experimental variables; again, 74D and 74F MOSs reported higher than average proportions of soldiers planning to reenlist, along with 13B and 19E.

It was hoped that all soldiers in the survey would report having an SM at the time of the survey. However, as clearly

*Throughout this report, we use pay grade as an indication of rank, and thus we label pay grades as "ranks."

Table II.4. Selected Descriptive Information for Respondents

School	MOS	N ¹	Age in Years ²		Rank Pay Grade ³							Months on Active Duty ⁴		Months in Current MOS ⁵	
			E1/2	E3	E4	E5	E6	E7							
Infantry		N = 159	25.4	(4.4)	1	9	26	32	31	1	46.0	49.1	50.2	18.3	
	11B	N = 77	25.6	(4.3)	0	10	29	32	29	0	46.3	47.3	50.2	14.2	
	11C	N = 82	25.0	(4.4)	2	6	42	33	16	1	45.6	50.9	49.4	42.8	
Armor		N = 69	24.9	(4.3)	5	5	30	27	31	0	50.4	51.3	35.3	31.7	
	13 11B	N = 40	23.8	(4.5)	7	10	18	25	20	0	48.6	49.6	39.3	33.4	
	13 11C	N = 10	26.6	(4.3)	0	0	20	30	4	0	55.0	51.5	40.3	19.0	
Artillery		N = 155	25.6	(4.3)	1	10	32	32	14	1	41.4	45.1	45.1	30.3	
	12B	N = 91	25.1	(4.5)	0	8	33	33	26	0	48.1	44.4	50.0	32.4	
	12C	N = 64	24.9	(4.3)	2	16	21	31	15	0	42.1	45.6	37.0	26.7	
Air Defense		N = 150	25.6	(4.7)	0	3	27	29	33	1	44.4	49.6	42.1	30.4	
	16B	N = 63	26.2	(5.0)	1	3	32	32	33	3	44.0	48.1	34.6	16.1	
	16C	N = 87	25.0	(4.5)	4	3	23	27	36	1	44.6	49.1	47.1	16.0	
Ordnance		N = 130	24.1	(4.7)	5	14	40	28	13	1	52.4	41.7	19.1	12.3	
	43B	N = 30	22.4	(4.4)	16	13	45	10	6	0	38.1	28.1	19.1	14.0	
	43C	N = 10	23.6	(3.6)	1	11	46	16	8	0	42.1	26.0	19.3	19.0	
	43B	N = 50	25.1	(5.2)	2	3	41	24	10	0	44.3	52.2	48.3	19.3	
	43C	N = 18	24.3	(6.2)	0	13	17	29	19	0	55.4	51.4	48.7	17.1	
	43B	N = 52	24.0	(4.1)	5	18	27	32	6	0	43.1	31.6	32.0	22.1	
Transportation		N = 34	25.0	(4.3)	12	11	26	29	13	1	39.1	50.6	47.4	12.3	
	57B	N = 21	25.3	(5.4)	19	16	28	22	16	0	58.1	55.0	45.4	18.1	
	54C	N = 33	24.7	(4.7)	3	3	40	32	10	0	55.3	47.3	48.4	45.1	
Aviation		N = 130	24.4	(4.2)	7	18	22	31	11	0	48.6	37.3	27.1	24.3	
	71B	N = 42	22.0	(3.5)	12	21	39	26	1	0	31.5	31.5	20.1	19.3	
	71B	N = 43	25.0	(4.3)	0	11	29	32	14	0	44.3	44.3	31.3	14.3	
	71C	N = 45	25.1	(4.1)	2	15	30	26	17	0	44.3	44.3	26.4	16.4	
Adminstr		N = 120	27.0	(5.3)	5	5	22	28	28	0	50.0	73.3	56.1	54.3	
	74D	N = 5	27.0	(5.2)	0	14	7	32	13	0	50.0	71.4	59.3	56.3	
	74E	N = 5	27.9	(7.5)	0	14	0	17	6	0	50.0	70.6	42.0	19.0	
Health Sciences		N = 120	26.2	(4.3)	0	18	44	19	23	0	56.1	50.1	40.4	41.3	
	75C	N = 29	26.2	(4.3)	0	15	44	19	23	0	56.1	50.1	42.4	41.3	
Communications		N = 115	27.0	(5.3)	12	16	26	17	21	0	39.4	75.7	19.3	41.3	
	76B	N = 44	28.1	(7.2)	9	16	22	16	3	0	49.3	30.7	13.7	40.3	
	76C	N = 61	26.2	(5.6)	10	17	28	10	32	0	70.1	71.7	41.3	42.7	
Military Police		N = 113	26.5	(5.0)	1	6	30	27	21	0	49.3	46.7	55.1	30.3	
	93B	N = 51	26.3	(5.2)	0	3	21	21	35	0	57.4	46.3	53.3	19.3	
	93C	N = 47	26.0	(4.5)	2	3	29	45	10	0	72.1	47.1	54.7	25.3	
OVERALL		N = 120	25.4	(5.0)	5	11	30	29	21	1	52.3	51.6	41.1	35.1	

Numbers are approximate since different numbers of soldiers had usable information on each question due to failure to respond, missing data, etc.

Numbers and/or are means; numbers in parentheses are standard deviations.

Four soldiers had MOS not included in the survey.

Table II.4. Selected Descriptive Information for Respondents (cont'd.)

School	MOS	N	Level of Education ⁴					Reenlist			Have SM? Yes	Took SQT? Yes
			1	2	3	4	5	Y	DK	N		
Infantry		N=161	5.6	70.0	23.8	0.6	0	29.7	28.3	41.3	31.2	39.4
	113	N=73	5.1	54.7	29.2	0	0	30.3	30.3	39.3	31.1	31.1
	110	N=33	6.1	73.2	19.3	1.2	0	29.3	26.3	43.9	32.7	38.0
Armor		N=70	11.4	62.9	24.3	1	1.4	34.3	27.1	38.6	35.3	41.4
	19/11D	N=40	12.5	67.5	17.5	0	2.5	25.0	30.0	45.0	31.6	50.0
	19/11E	N=30	10.0	56.7	33.3	0	0	46.7	23.3	30.0	30.0	76.7
Artillery		N=156	5.1	60.3	30.3	1.9	1.3	40.0	29.4	21.5	39.1	30.4
	133	N=90	5.5	59.0	33.1	1.2	0	44.0	25.1	30.9	37.3	32.0
	13E	N=54	4.7	46.3	42.3	1.6	4.7	34.9	33.1	32.7	30.6	39.1
Air Defense		N=151	11.3	60.6	26.3	1.3	0	31.1	30.3	38.3	30.7	38.0
	149	N=66	9.2	61.5	26.2	0.2	0	40.2	23.1	36.3	39.4	30.3
	14R	N=35	13.7	60.0	26.3	0	0	25.3	34.7	40.0	31.6	36.0
Ordnance		N=134	17.4	64.3	17.4	1.1	0	28.4	27.9	43.7	76.4	53.3
	45K	N=121	29.0	58.1	12.9	0	0	15.1	22.6	62.3	64.5	45.0
	45L	N=13	30.9	69.1	0	0	0	30.5	15.4	46.1	59.1	69.1
	61B	N=62	13.7	68.6	15.7	1.0	0	43.1	25.5	22.4	72.0	64.7
	61C	N=39	13.1	55.3	31.6	0	0	33.1	36.3	29.3	78.7	52.6
	61H	N=12	13.7	58.6	15.7	2.0	0	22.0	30.0	48.0	30.0	45.0
Transportation		N=34	11.4	57.9	9.5	1.2	0	33.3	28.6	38.1	76.2	29.0
	77R	N=32	14.4	59.4	6.3	0	0	24.4	21.9	43.3	34.4	31.0
	64C	N=52	13.5	70.2	11.5	1.9	0	22.7	32.7	34.6	71.2	20.6
Aviation		N=121	5.3	43.5	46.6	3.3	0.2	20.3	31.5	47.7	39.3	41.1
	71D	N=42	11.9	52.4	28.6	4.3	2.4	23.6	45.2	26.2	42.9	15.7
	93R	N=42	4.3	38.1	54.3	2.4	0	17.1	34.2	48.3	38.1	39.5
	93J	N=41	0	40.4	55.3	4.1	0	17.0	17.0	66.0	57.0	46.3
Admincen		N=11	0	55.0	43.3	0	0	46.3	18.3	34.4	71.3	64.5
	74C	N=10	0	55.4	34.6	0	0	46.2	15.4	38.5	59.0	60.0
	74F	N=6	0	16.7	33.3	0	0	50.0	33.3	16.7	10.0	93.3
Health Sciences		N=19	0.4	51.7	44.3	0	0	41.4	20.7	37.3	35.0	27.6
	78C	N=19	0.4	51.7	44.3	0	0	41.4	20.7	37.3	35.0	27.6
Quartermaster		N=115	5.7	64.3	29.5	0	0	39.4	25.0	25.6	60.6	30.5
	75P	N=44	4.3	59.1	34.2	0	0	30.2	20.9	48.3	48.2	51.0
	75C	N=51	4.9	68.3	26.2	0	0	45.9	27.9	26.2	58.0	50.6
Military Police		N=123	1.3	46.0	48.1	2.3	0.3	30.2	24.0	35.3	31.2	79.6
	95B	N=61	1.6	44.3	49.2	4.3	0	28.3	31.7	40.0	32.7	68.9
	95C	N=47	0.1	48.9	46.9	0	2.1	32.6	37.0	30.4	34.8	91.6
OVERALL		N=1200	9.0	59.3	29.0	1.4	0.3	32.2	28.6	29.2	31.1	46.1

⁴The codes are defined as follows: 1 = did not complete high school; 2 = high school graduate; 3 = some college; 4 = college graduate; 5 = postgraduate work.

shown in the table, a surprisingly high proportion (16.9%) of the sample did not. Some of these soldiers reported previously owning an SM but not having it currently; nevertheless, the data indicate that the Army ideal of each soldier having his or her individual SM was not realized (at the time of this survey). In particular, the Ordnance and Quartermaster MOSs show relatively low proportions of soldiers with SMs. It remains to be seen whether this can be interpreted as due to poor SMs (thus less desire to retain it), administrative breakdowns (the SMs are not getting to the soldiers), or simply as a function of the length of time that the EPMS has been in place for different MOSs. This last interpretation (i.e., the SMs are new, SQTs have only recently been fielded, SQT notices have not been produced) is supported by an examination of the proportions of soldiers who have taken an SQT for each MOS. With certain exceptions (the Armor, Aviation, and Health Sciences MOSs), the proportion of soldiers who have an SM is directly related to the proportion of soldiers who have taken an SQT. The exceptions are also directly supportive: although not shown in the table, the survey took place during the SQT "window" for these MOSs. (In fact, most of the 93H and 93J soldiers at Fort Campbell participated in the survey during the week immediately preceding their SQT.) As will be discussed in more detail later, the correspondence between SM use and SQT involvement is a key feature of the data.

Ideally, each soldier in the survey should have gone through a minimum sequence of activities relating to the EPMS. The following table shows a slightly elaborated time line of EPMS events and the proportion of soldiers in the entire sample who have completed each activity.

Received MOS at AIT	81%
Received SM at AIT	29% (of 81%)
Received SM	83%
Received help in use of SM	44% (of 83%)
Received IJT in MOS	71%
Received SQT Notice	67%
Received help in use of Notice	94% (of 67%)
Took an SQT	66%
Used SM to study for SQT	58%
Used SQT Notice to study for SQT	57%
Received SQT score	33%

The above table includes several variables that will be dissected in later sections of this report; the major purpose of presenting this information here is to provide a framework in which to view later results and to familiarize the reader with basic variables affecting SM usage and effectiveness.

We have been deliberately selective with respect to the results presented in this chapter. The following chapters examine various aspects of the data base in considerably more detail, including many of the "user characteristics" and "training environment" variables mentioned above.

III. SOLDIER'S MANUAL DOCUMENT CHARACTERISTICS

A major thrust of this study is to evaluate Soldier's Manuals in terms of their ease of use, comprehensibility, accuracy, and completeness. The simplest way to characterize this phase of the analysis is that it is an attempt to locate and describe particular problems that soldiers report having with their manuals, and to determine, where possible, the causes and consequences of these problems. Such information may be of immediate value to manual writers and designers who are in a position to modify features of the manuals.

One point must be kept in mind throughout the discussion: the decision to consider a certain percentage of soldiers reporting a particular problem as constituting a "real" difficulty is, of necessity, arbitrary. We have adopted the rule that if 20% of a given sample (or sub-sample) report a particular problem, it is worth noting. This section will address problems reaching this criterion; more complete information about survey results not reaching this criterion is presented in the Appendix.

The presentation is organized into four parts. First, the physical characteristics of SMs are described. Then survey findings are presented by type of problem: Ease of Use, Comprehensibility, SM Test Sections, and the SM and the Job. Each problem is described first for the entire sample and then examined in more detail for different breakdowns of the subject population. Changes and recommendations suggested by the soldiers are discussed. The chapter concludes with a summary of the results of the survey of SM characteristics.

PHYSICAL CHARACTERISTICS

Before presenting and discussing the survey data, it is necessary to describe some physical aspects of the Manuals. As a group, the SMs have certain common characteristics:

- They all measure 10" by 7.75".
- Sections are color-coded by Skill Level (SL1 is white, SL2 is yellow, SL3 is green, and SL4 is salmon).
- They all have certain common sections: a Table of Contents; an Introductory Section (usually titled "The Soldier's Manual and You"); a section on how to use the manual; a section which describes (in more or less detail) the EPMS; a task list or inventory; and sections containing task descriptions (with accompanying conditions and standards).

However, the set of SMs also differ substantially on many features. For example, in any particular MOS, the different sections for different Skill Levels may or may not be bound

together as a single volume. (All Manuals are required to have three-hole punches so that a soldier can combine sections and enlarge his SM as his Skill Level advances. However, some SMs are printed as single volumes for two, three, or four Skill Levels.) Likewise, some SMs contain a "Common Soldier Task" (CST) section, while others do not.

Table III.1 presents information regarding differences among the SMs for the MOSSs included in this study. The table indicates whether the different Skill Level sections are bound together, whether the SMs contain a CST section, the date of publication, and the issuing School. Table III.1 also specifies the number of pages in each manual, whether the binding is stapled or glued, and the Readability Score for each, by Skill Level.

This Readability Score was computed by using the Kinkaïd-Flesch adjustment to the Flesch Score.* This formula is:

$$\text{Grade Level} = .39 (\text{words per sentence}) + 11.8 (\text{syllables per word}) - 15.59$$

The Grade Level is computed for 100-word samples selected randomly from the text.

Finally, Table III.1 presents some "subjective" judgments concerning the SMs. We judged:

- whether the "SM Usage" section was adequate;
- whether the page numbering would be meaningful to the typical user; and
- whether each task description contained sufficient step-by-step information to enable a typical user to perform the task.

*Kincaid, J. P., Fishburne, R. P., Rogers, R. L., and Chissom, B. S. Derivation of new readability formulas (Automated Readability Index, Fog Count, and Flesch Reading Ease Formula) for Navy enlisted personnel. Research Branch Report 8-75. Millington, Tennessee: Naval Air Station Memphis, February 1975.

Table III.1
Physical Characteristics of the SM

<u>MOS</u>	<u>School</u>	<u>Index by Skill Level</u> ¹	<u>SM Usage</u> ²	<u>Books</u> ³	<u>Staple/Glue</u>	<u>CST</u>
11B	Infantry	Yes	Yes	1;2;3	Loose;Staple;Staple	Yes
11C	Infantry	Yes	Yes	1;2;3	Glue;Staple;Staple	Yes
11D	Armor	Yes	No	1/2;3	Staple	Yes
11E	Armor	Yes	No	1/2;3	Staple	Yes
13B	Artillery	No;Yes	Yes;No	1/2;3	Staple	Yes
13E	Artillery	No;Yes	Yes;No	1;2;3	Staple	Yes
16P	Air Defense	Yes	Yes	1/2;3/4	Staple	Yes
16R	Air Defense	Yes	Yes	1/2;3/4	Staple	Yes
45K	Ordnance	No;Yes	Yes	1/2;3	Staple	Yes
45L	Ordnance	No;Yes	Yes	1/2;3	Staple	Yes
57H	Transportation	No; --	Yes; --	1;2; --	Staple	Yes
63B	Ordnance	No;Yes	Yes	1;2;3	Staple	Yes
63C	Ordnance	No; --	Yes; --	1;2; --	Staple	Yes
63H	Ordnance	No;Yes	Yes	1/2;3	Staple	Yes
64C	Transportation	No	Yes	1/2/3	Staple	Yes
71P	Aviation	No;Yes	Yes	1/2;3	Staple	Some
74D	Admancen	No;Yes	Yes;No	1;2;3	Staple	No
74F	Admancen	No;Yes	Yes;No	1;2;3	Staple	No
76C	Health Sciences	Yes	Yes;No	1;2;3	Staple	Yes
76P	Quartermaster	No	Yes	1;2;3;4	Staple	Some
76V	Quartermaster	No; --	Yes; --	1;2; --	Staple	Some
93H	Aviation	No;Yes	Yes;No	1;2;3	Staple	Some
93J	Aviation	No	Yes;No	1;2;3	Staple	Some
95B	Military Police	No;Yes	Yes	1/2;3	Staple	Yes
95C	Military Police	No	Yes;No	1;2;3	Staple	Some

¹ Does the SM have an individual Table of Contents entry for each Skill Level task?

² Does the SM have a section on how to use the SM?

³ This column shows how the individual Skill Levels are combined. A slash (/) indicates that the Skill Levels are bound together; a semicolon indicates separate volumes.

Table III.1 (continued)
Physical Characteristics of the SM

MOS	Date	# of Pages	Meaningful #s ⁴	Step by Step ⁵	Readability by Levels ⁶		
					10	20	30
11B	5/76	247;52;95	Yes	Yes	10.62	10.97	10.33
11C	7/76	263;82;37	Yes	Yes	11.11	10.02	11.08
11D	9/76	86;15	Yes	Yes	8.15	11.17	13.64
11E	9/76	92;32	Yes	Yes	8.33	9.74	10.23
13B	4/77	172;92	Yes/No	Yes	7.31	9.43	10.39
13E	5/77	202;40	Yes/No	Yes	8.25	10.33	10.71
16P	9/76	106	Yes	Yes	9.57	10.43	11.67
16R	9/76	125	Yes	Yes	9.61	9.10	11.70
43K	7/76	119;145	Yes/No	Yes	11.17	10.41	12.49
43L	1/77	203;130	Yes	Yes	8.43	10.78	12.67
57H	2/77	145; --	Yes; --	Yes	9.3	9.17	--
63B	1/77	110;50	Yes/No	Yes	9.29	11.35	12.14
63C	1/77	163; --	Yes; --	Yes	9.86	10.68	--
63H	5/76	114;58	Yes/No	Yes	9.55	10.47	12.82
64C	7/77	97	Yes	Yes	9.51	9.51	11.34
71P	3/76	94;25	Yes/No	Yes	11.02	12.45	14.04
74D	1/77	90;24	Yes	Yes	10.54	11.41	10.58
74F	1/77	58;32	Yes	Yes	12.14	10.22	10.98
76C	4/77	102;16	Yes/No	Yes	12.03	10.68	13.17
76P	1/77	42;36	Yes	Yes	11.70	11.70	10.80
76Y	1/77	48; --	Yes; --	Yes	10.86	10.94	--
93H	3-4/77	114;44	Yes/No	Yes	12.13	13.12	15.65
93J	12/76	124;52	Yes/No	Yes	10.89	15.43	14.03
95B	12/76	135;52	Yes	Yes	10.68	9.88	11.55
95C	2/78	126;24	Yes	Yes	12.32	14.08	12.68

⁴Does the SM have consecutive numbering within a volume?

⁵Does the SM describe the individual task in a step-by-step fashion?

⁶Entries are Grade Level Equivalents (see text). Columns refer to Skill Levels for each MOS.

SURVEY FINDINGS

Ease of Use

General trends. Four characteristics of SMs were included in the Ease-of-Use category. These were size, bulk, binding and print. In general, the size, bulk, and print of the SM were considered acceptable. Regarding size, 86%* of the soldiers reported no problem. Of the remaining 14%, practically all thought the SM was too large; less than 1% said the SM was too small. Similarly, of the 17% of the soldiers who reported problems with the bulk of the SM, 15% said it was too thick or too heavy. Less than 3% of the soldiers had any problems with the legibility of the printing.

On the other hand, significant problems were reported regarding binding: 38% said that the binding came apart, and another 9% said that the books did not lie flat. Although it is not clear from the data, it is our judgment that these problems are not due to the fact that many of the SMs are segmented (see Table III.1). Rather, the staples and gluing used to hold the pages together are insufficient for many books. An examination of our sample of manuals showed the staples to be occasionally too small or improperly placed; the manuals with a glue binding uniformly came apart. Perhaps a reexamination of the binding procedures currently employed would suggest alternatives to simple stapling.

Schools and MOSSs. To further isolate specific physical problems, the incidence of reported problems was tallied for each MOS and for the Proponent Schools. This information is summarized in Table III.2. Worthy of note is that the size and bulk problems are predominantly limited to the Infantry MOSSs (11B and 11C). These are by far the thickest SMs in our catalogue, each approximately twice as thick as any other manual. We cannot speculate as to the reason why these manuals are substantially thicker; however, in terms of ease of use, some thought must be given to reducing their bulk. Similarly, reducing their physical dimensions to the size of Army SMART books,* for example, might make them more portable and better suited to the needs of the foot soldier.

Binding is a problem for all SMs; in particular, exceptionally high percentages of soldiers report problems with the same Infantry SMs (11B and 11C), the 76J (Health Sciences), the 19/11D (Armor), and the 45K (Ordnance) manuals. There is no particular pattern of binding that would indicate a systematic cause of the problems in these specific cases; hence, specific recommendations would be speculative and unwarranted.

*All percentages reported in this section refer to the proportion of soldiers who responded to the particular item. If a soldier never used an SM, he did not respond to this set of questions.

*The Army SMART book is approximately 6" x 4".

Table III.2. Problems with Ease of Use by
MOS and School¹

School	MOS	% Reporting Problems ²			
		Size	Bulk	Binding	Print
Infantry	(≈ 151) ³	24	32	75	03
	11B (≈ 81)	21	28	73	01
	11C (≈ 73)	27	34	74	03
Armor	(≈ 62)	06	06	51	02
	19/11D (≈ 33)	06	06	55	00
	19/11E (≈ 27)	07	07	50	00
Artillery	(≈ 148)	13	18	51	05
	13B (≈ 79)	18	16	47	04
	13E (≈ 63)	06	19	52	03
Air Defense	(≈ 146)	14	13	50	03
	16P (≈ 57)	12	14	47	07
	16R (≈ 82)	15	12	52	00
Ordnance	(≈ 120)	12	15	35	05
	45K (≈ 17)	18	12	65	00
	63B (≈ 34)	06	09	24	03
	63C (≈ 24)	12	17	37	00
	63H (≈ 34)	11	20	41	09
Transportation	(≈ 36)	16	19	42	06
	64C (≈ 25)	12	16	48	04
Aviation	(≈ 110)	07	07	30	01
	71P (≈ 37)	06	06	23	00
	93H (≈ 37)	03	11	27	00
	93J (≈ 36)	11	05	42	03
Admincen	(≈ 21)	05	05	24	05
	74D (≈ 15)	00	00	27	06
Health Sciences	(≈ 22)	4	50	52	09
	76J (≈ 21)	14	52	55	10
Quartermaster	(≈ 63)	15	15	31	03
	76P (≈ 26)	11	08	29	00
	76Y (≈ 36)	17	19	31	08
Military Police	(≈ 96)	10	12	43	01
	95B (≈ 49)	18	20	52	02
	95C (≈ 42)	05	07	33	00
SCHOOL TOTAL	(≈ 367)	14	17	47	03

¹The MOS listed for each school do not necessarily constitute the entire sample of that school. MOS with less than ten respondents are not reported in the table, but are included in the school totals.

²"Problems" are defined as any response other than "OK" by a soldier; thus, "too big" and "too small" are both included in the "size" problems. See text for a discussion of specific problems.

³Ns are approximate in that each percentage is based upon only the soldiers who responded to the particular question; this number varied slightly with each question.

Rank. There were no systematic relationships between soldiers' rank and reported incidence of ease-of-use problems. No single rank had more than 20% of the respondents reporting problems with size or print. For problems with bulk, ranks E3 through E6 had between 15% and 22% of the respondents mentioning a problem (with E4s slightly higher than the others). With respect to binding, all ranks (E2-E6) reported approximately the same incidence (approximately 47%); again, the reported percentage of those encountering a binding problem was slightly higher for E4s than for the others.

This finding is moderately surprising in that the successive SMs for Skill Levels within an MOS are supposed to be loose-leaf bound cumulatively; therefore, the higher ranks (and higher Skill Levels) presumably should be using bulkier, heavier, more cumbersome SMs. This result reinforces our suspicion that the problems reported here (primarily the binding) are not a function of having to bind together the segmented Skill Levels, but rather are caused by the improper binding of each book.

Study Groups. The final breakdown to be examined for a possible systematic explanation of ease of use problems is the "Study Groups." It was possible to characterize each soldier in the sample in terms of his general position in the EPMS cycle (i.e., with respect to the major EPMS "events" of receiving an SM, receiving his SQT Notice [or notification of an upcoming SQT], and the actual SQT for his MOS). Thus, each soldier (at the time of the survey) had taken an SQT, was scheduled to take one, or had not been scheduled for one. For the soldiers who had taken or were scheduled to take an SQT, some had received an SQT Notice and others had not. Finally, soldiers were asked to indicate whether or not (and when) they studied for the SQT. "Crossing" these dimensions resulted in an unambiguous categorization of ten groups:

1. Soldiers who had taken an SQT, had not received an SQT Notice, and had not studied for the SQT;
2. Soldiers who had taken an SQT, received a Notice, and had not studied for the SQT;
3. Soldiers who had taken an SQT, received a Notice, and had begun studying only after having received the Notice;
4. Soldiers who had taken an SQT, received a Notice, and had begun studying before receiving the Notice;
- 5-8. Same as Groups 1-4, except instead of having taken an SQT, they were scheduled to take one;

9. Soldiers who had not taken an SQT, were not scheduled to take one (and hence had not received a Notice), and did not report studying for the SQT;
10. Same as Group 9, except reported having studied for the SQT.

It is conceivable that the different EPMS experiences (and hence different patterns of SM use) would affect the soldiers' opinions of the physical characteristics of the SM. Table III.3 presents these data.

As a general trend, soldiers who have taken an SQT (Groups 1-4) seem to report a slightly higher incidence of problems than the other groups. However, the differences among the groups are relatively minor for all dimensions; it is our opinion that the general trends probably typify the findings, independent of Study Groups.

Comprehensibility

General trends. Several questions pertaining to the comprehensibility of the SM were asked. Included were the following:

- Is the purpose of the SM clearly stated? (PURPOSE)
- Is how to use the SM clearly stated? (USE)
- Are tasks easy to find in the SM? (FIND)
- Are tasks grouped appropriately? (GROUPED)
- Are the words in the SM job-related? (JOB WORDS)
- Are the words easy to understand? (HARD WORDS)

The overall proportions of soldiers expressing difficulty with these dimensions is shown below.

Problems with Comprehensibility

<u>Question</u>	<u>N</u>	<u>N</u>
PURPOSE	04	990
USE	06	993
FIND	11	997
GROUPED	11	995
JOB WORDS	16	989
HARD WORDS	08	994

Table III.3. Ease-of-Use Problems by Study Groups

	<u>Group Description</u>	<u>% Reported Problems</u>			
		<u>Size</u>	<u>Bulk</u>	<u>Binding</u>	<u>Print</u>
1.	SQT, no notice, no study (≈ 42)	14	24	51	10
2.	SQT, SQT notice, no study (≈ 122)	21	28	48	02
3.	SQT, study after SQT notice (≈ 322)	14	14	51	02
4.	SQT, study before SQT notice (≈ 228)	12	15	51	03
5.	Scheduled, no notice, no study (≈ 21)	9	05	33	09
6.	Scheduled, SQT notice, no study (≈ 40)	17	20	28	07
7.	Scheduled, study after SQT notice (≈ 54)	7	17	43	02
8.	Scheduled, study before SQT notice (≈ 31)	12	3	23	03
9.	No SQT, not scheduled, no study (≈ 85)	12	16	46	05
10.	No SQT, not scheduled, study (≈ 33)	9	18	38	03

As can be seen, there were no particularly troublesome areas regarding comprehension. Very few soldiers report problems in understanding the purpose of the SM or how it is to be used. Similarly, relatively few soldiers report that the words are hard to understand. This latter finding is moderately surprising considering some other pieces of information collected. For example, several senior interviewees mentioned that there might be significant language problems, especially for non-native-English speaking soldiers. Similarly, the "readability" analysis (reported above) of the SMs would suggest that the manuals would require higher reading levels than the modal education level in the current sample (grade).

Schools and MOSs. Table III.4 shows the breakdowns for responses to these comprehensibility questions by individual School and MOS. When examined at this more detailed level, it appears that four of these questions might pose important issues for particular MOSs. Excessive difficulty with finding tasks in the SM were reported by the 13E (Cannon Fire Direction Specialist) and 76J (Medical Supply Specialist) MOSs (according to our criterion of more than 20% of the sample responding negatively). This difficulty parallels reported problems with the grouping of tasks in the SM, where the same MOSs (plus 63H) reported difficulties. It will be recalled that these same MOSs also had problems with the bulk of the SM. All of these problems are probably interrelated. If an SM is bulky, it must have a good index in order to be used efficiently. Furthermore, if the SM is organized into sections, with the task list at the beginning of each section, care must be taken to avoid either of two extremes: sections that are too small (and therefore very numerous, making it necessary to scan many task lists in order to find a single task) or too large (making it necessary to scan very long task lists). Similarly, tasks must be grouped together according to what will be most efficient or logical for the user of the manual. We cannot make specific recommendations regarding particular MOSs and the best organization to use, but the principle is apparent: the manual should be organized the same way that the soldier's job is to perform several different functions (e.g., maintenance, operation, repairing) on several different pieces of equipment (e.g., different weapons). The organization of the manual should follow the typical mode of operation of the soldier's daily activities. Thus, if he usually performs these several functions on one piece of equipment at a time, the manual should be organized by equipment. On the other hand, if the soldier typically performs one function on several pieces of equipment, the manual should be organized by functions. To repeat, the organization should conform to the user's needs in order to be efficient.

Similarly, there is no simple rule for deciding the best tradeoff between length of sections and length of task lists. As a general observation, however, we would recommend putting a complete task list at the front of each manual, rather than forcing the soldier to search for particular pages more than once

Table III.4
Problems with Comprehensibility by MOS and School

		Reporting Problems					
School	MOS	Purpose Unclear	Use Not Clear	Cannot Find Tasks	Tasks Not Grouped	Words Not Related	Words Hard Understand
Infantry	(≈151)	2	3	8	9	12	4
	11B (≈81)	1	2	10	7	15	4
	11C (≈73)	3	4	8	12	12	7
Armor	(≈62)	4	3	9	8	12	11
	19/11D (≈34)	3	3	14	8	17	14
	19/11E (≈27)	7	4	4	4	7	4
Artillery	(≈151)	4	9	16	17	9	7
	13B (≈80)	2	9	11	14	6	5
	13E (≈63)	6	8	23	20	11	6
Air Defense	(≈141)	3	6	10	7	14	7
	16P (≈58)	2	2	15	5	10	7
	16R (≈83)	4	3	6	8	17	8
Ordnance	(≈123)	4	9	10	15	18	8
	45K (≈17)	12	5	12	6	19	12
	45L (≈8)	--	--	--	--	--	--
	63B (≈35)	3	6	6	8	11	3
	63C (≈24)	0	12	4	3	25	4
	63H (≈34)	3	9	14	21	18	6
Transportation	(≈37)	10	5	8	10	21	16
	67H (≈9)	--	--	--	--	--	--
	64C (≈26)	8	8	8	12	16	4
Aviation	(≈110)	2	9	11	14	16	2
	71P (≈32)	0	12	16	12	9	0
	73H (≈37)	0	8	5	14	19	0
	73C (≈37)	6	8	8	16	16	0
Communications	(≈22)	0	0	14	14	19	14
	74L (≈16)	0	12	12	19	12	19
	74F (≈3)	--	--	--	--	--	--
Naval Sciences	(≈22)	4	4	23	19	23	14
	74J (≈21)	5	5	24	20	24	14
Quartermaster	(≈64)	6	5	8	8	24	19
	76F (≈19)	3	0	3	0	26	7
	76Y (≈37)	11	11	11	16	24	24
Military Police	(≈97)	2	4	7	9	21	4
	85B (≈50)	4	6	12	16	28	6
	95C (≈42)	0	0	2	2	18	2
SCHOOL TOTAL (≈987)		4	6	11	11	16	8

(e.g., to find the right section, then to find the right task within a section). We also do not consider it particularly useful to paginate sections individually (unless it is expected that the manuals will be disassembled and reassembled later).

The two other problems worthy of note are the relationship between the words in the manual and the words commonly used on the job and the general difficulty of the words themselves. The latter problem (mentioned by 76Y and marginally by 74D) is a very complex issue, involving basic reading levels of the soldiers, experience in the Army, and the nature of the jobs. In these particular cases, however, we suspect that part of the problem is due to the nature of the jobs and the necessary material included in the SMs. The 74D (Computer Machine Operator) position (and therefore the SM) involves numerous technical, standardized terms that cannot be altered or simplified. Similarly, the 76Y (Unit and Organizational Supply) job deals in large measure with standard Army-wide forms with long (perhaps complicated) names. Short of Army-wide changes in policy and/or nomenclature, we can offer no specific suggestions for this problem.

Regarding the relationship between the vocabulary in the SMs and words used on the job, many more soldiers from several schools reported discrepancies. The Transportation (57H and 64C), Health Sciences (76J), Quartermaster (76P and 76Y), Military Police (95B and 95C), and Ordnance (45K, 63C, and 63H) Schools all reported significant problems. Taken in conjunction with other information presented below regarding the discrepancies between the tasks in the SM and the tasks performed on the job, this problem points to one of the critical issues regarding SM construction: the adequacy and generality of the methods used to generate the content of the SM.

Although the Army has, to a certain degree, standardized task analytic procedures, there are substantial areas where Proponent School judgment becomes involved in the determination of SM content. Among others, these areas include questions of inclusivity in the SM, level of detail included, what the "frame of reference" is for the task analysis (e.g., the knowledge of the soldiers in the particular MOS), and the particular content of specific tasks in the SM.

The first of these issues, inclusivity in the SM, refers to the number of tasks presented. Stating this more basically, the question is how to decide what constitutes a "task" when performing task analysis. To illustrate the potential problem, consider the 11E3 task, "Fire the main gun from the TC position" (FM 17-11E3). This task also includes the training standard, "Within 5 seconds in daylight or 10 seconds illumination using battlesight or within 10 seconds during daylight or 15 seconds under illumination using precision technique, for each target, engage stationary and moving targets." The task description also mentions "subtasks" of applying lead with different types of ammunition (APDS-T, HEAT-T, and HEP-T), and "adjust for target

destruction." This is the only task in the 11E3 SM that mentions firing the main gun. Clearly, this is a generalized statement, representing a large number of discrete tasks (each involving different skills and procedures) that could easily be identified. For example, in other work conducted for ARI, 123 different "tasks" were generated and described that involved firing the main gun.* It would be hard to defend the description in the SM as meeting any definition of a "task"; however, the decision was made to include this one "metatask" rather than a large number of other tasks. We do not mean to quibble with this particular 11E3 task; rather, we hope to illustrate the "inclusion" type of issue in SMS.

The second issue is the level of detail included in task descriptions. This problem is similar to the issues involved in the example above on inclusivity: just how much detail should be presented in the SM regarding each task? One of the "subtasks" or "steps" in the above task is the general statement, "adjust for target destruction," with no further elaboration of what this involves. Clearly, more information could have been provided; however, it has been assumed that soldiers will know what this means and what is involved in task performance.

This "assumption" brings us to the last two issues; namely, the frame of reference for the task analysis and the particular task content. Certainly, for some soldiers, the meaning of the statement "adjust for target destruction" will be obvious; it was probably obvious to the person who wrote the SM (presumably a subject-matter expert). However, it is not apparent that all 11E3 soldiers have the same understanding of the statement. More generally, the use of any particular phrase or terminology in the SM must be based on some assumptions regarding the knowledge or training experience of the soldiers in the MOS. Given the data presented above regarding the conflict between the vocabulary in the SM and words used on the job, the inference is that frequently the assumption of particular knowledge of the soldier is incorrect. This is not to say that the terminology used in SMS is wrong in any sense; rather, that the terminology is different. We assume that choice of terminology was (at least in part) guided by expectations of what most of the soldiers would understand; we do not know if any procedures are currently employed to evaluate these expectations. We would recommend that such procedures (e.g., field-testing SMS, including incumbents in the writing process, etc.) be used if they are not already part of the system. Terminology is a potential problem, particularly in those machine-ascendant or administrative jobs where the terms are likely to change with new hardware, forms, etc.

*Boltovici, J. A., Boycan, G. G., Fingerman, P. W., & Wheaton, G. R. M60A1A1S Tank Gunnery Data Handbook. ARI Technical Report TR-79-A7. Alexandria, VA.: U.S. Army Research Institute, March 1979.

Rank. There were no systematic relationships between rank and any of the comprehension issues. The only significant problems were for the "words not job-related" question as reported by the E2 (24%) and E3 (21%) ranks. We believe that this is a manifestation of the problems discussed above: the lower ranks (and hence less-experienced soldiers) are precisely those soldiers who would have the least influence on the content (i.e., the terminology) of the SM. They are the least likely ranks to have been consulted regarding words and phrases that they use on the job. They are less likely than more experienced soldiers to have learned "correct" (i.e., SM) terminology. And they were probably not involved in SM generation. Again, the only "solution" is to involve these lower ranks in the testing-evaluating-rewriting process.

Study Groups. Table III.5 shows the proportion of soldiers having comprehension problems as a function of the different Study Groups. Again, the only particular dimension with significant problems is JOB WORDS--the relationship between words in the SM and words used on the job. An examination of Table III.5 shows an interesting pattern: with a single exception (the "scheduled, no notice, no study group"), few soldiers who used the SM to study for the SQT had a problem, while many who did not use the SM to study reported difficulties. Since soldiers in all groups had their SMs and understood the purpose and use of SMs, it is a relatively safe assumption that all groups tried to use the SM; the inference is that for some of the groups, the reason that they did not use it was because the words were not job related. Restating this point, if (from the perspective of an individual soldier) the SM does not seem to be job related, he/she will not use it to study for the SQT. Since SQT performance is related to studying with the SM (as will be described in a later section of this report), the above finding has potentially important consequences. It is tempting to speculate that if the SMs were made more job relevant, more soldiers would use them to prepare for the SQT and as a consequence, more soldiers would perform better on the test. Clearly, this chain of inferences has not been unarguably documented in this study; nevertheless, the recommendation that the SMs be made more job relevant could have valuable consequences.

The SM Test Sections

General trends. Soldiers were asked two questions regarding the sections of the SM which deal specifically with test standards, conditions, and performance measures. Most soldiers (84% of 992 respondents) thought that these sections were clear and specific. However, when asked if these statements of

Table III.5
Comprehension Problems by Study Groups

Group Description	% Reported Problems					
	Purpose Unclear	Use Not Clear	Cannot Find Tasks	Tasks Not Grouped	Words Not Related	Words Hard Understand
1. SQT, no notice, no study (n ≈ 43)	05	05	11	16	<u>33</u>	<u>20</u>
2. SQT, SQT notice, no study (n ≈ 123)	06	10	11	13	<u>20</u>	07
3. SQT, study after SQT notice (n ≈ 325)	04	06	11	11	11	03
4. SQT, study before SQT notice (n ≈ 230)	03	07	09	11	11	08
5. Scheduled, no notice, no study (n ≈ 21)	00	15	05	05	10	14
6. Scheduled, SQT notice, no study (n ≈ 41)	05	02	05	15	<u>22</u>	17
7. Scheduled, study after SQT notice (n ≈ 55)	02	11	13	11	13	00
8. Scheduled, study before SQT notice (n ≈ 32)	00	03	06	06	03	00
9. No SQT, not scheduled, no study (n ≈ 89)	03	01	13	12	<u>30</u>	14
10. No SQT, not scheduled, study (n ≈ 34)	03	06	12	09	<u>24</u>	18

standards, conditions, and measures were job related, 21% (of 985 respondents) answered that some, few, or none were.* These two issues are each similar to topics included under the "Comprehensibility" and "SM and Job" headings. They have been set apart primarily because of the specificity of content; that is, the focus is on the statements of test conditions, standards, and measures.

Schools and MOSs. Table III.6 summarizes the proportion of respondents who reported problems regarding these two issues. (A response was scored as a "problem" if, for each question, the soldier answered that some, few, or none of these sections in the SM were clear or job related.) As can be seen, problems of clarity of the test sections were reported for several MOSs and Schools. The Artillery School (principally due to the 13E MOS), the ADMINCEN (74D), Health Sciences (76J), and Quartermaster School (76P and 76Y) all reported significant problems. Other isolated MOSs with significant problems are 45K, 68H, and 93J. There does not seem to be any systematic correspondence among these MOSs; thus no general recommendations can be made on how to resolve this problem.

The second issue (the job relatedness of test sections in the SM) appears to be a serious problem: six of the 11 schools and 13 of the 25 MOS had more than 20% of the respondents answering that some, few, or none of these sections were job related. The problems appear to be particularly pronounced for the noncombat MOSs and Schools. Problems on this particular item could stem from several different sources, including the perceived inappropriateness of the test conditions and/or standards vis a vis those actually found on the job, and/or perceived differences between "peacetime" and "combat" standards. Each of these potential sources involves some complex issues: discussion will be deferred until a later section of this report.

Rank. There were no systematic trends relating this class of problems to rank.

Study Groups. Data concerning the different Study Groups are presented in Table III.7. As was true previously, there is a tendency for soldiers who did not use the SM to study for the SQT to report that the relevant sections in the SM were not job related. Furthermore, there is a general correspondence between these two problems: groups reporting problems with clarity also report problems with job relatedness. Again, it is tempting to suspect a cause-and-effect relationship: if the sections are not clear (or not job related), the SMs will not be used for study, despite the "correctness" of the sections on the test situation, conditions, measures, and standards.

*This question may have been ambiguous in that for some manuals the step-by-step task descriptions are called performance measures, while for others the performance measures are separated from the detailed task descriptions.

Table III.6

SM Test Section Problems by School and MOS

	% Reported Problems	
	Test Sections <u>Unclear</u>	Test Not Job <u>Related</u>
Infantry (≈ 151)	9	8
11B (≈ 81)	10	10
11C (≈ 73)	9	8
Armor (≈ 62)	3	12
19/11D (≈ 33)	6	6
19/11E (≈ 27)	0	22
Artillery (≈ 148)	20	12
13B (≈ 79)	11	13
13E (≈ 63)	28	9
Air Defense (≈ 146)	16	18
16P (≈ 57)	10	16
16R (≈ 82)	18	22
Ordnance (≈ 123)	16	31
45K (≈ 17)	24	35
45L (≈ 8)	--	--
63B (≈ 35)	6	16
63C (≈ 24)	12	46
63H (≈ 34)	26	35
Transportation (≈ 37)	16	39
57H (≈ 9)	--	--
64C (≈ 26)	19	38
Aviation (≈ 110)	15	27
71P (≈ 32)	12	22
93H (≈ 37)	8	22
93J (≈ 37)	22	31
Admincen (≈ 22)	32	45
74D (≈ 16)	25	44
74F (≈ 3)	--	--
Health Sciences (≈ 22)	23	59
76J (≈ 21)	19	62
Quartermaster (≈ 64)	25	35
76P (≈ 28)	21	41
76Y (≈ 37)	30	32
Military Police (≈ 97)	15	18
95B (≈ 50)	18	18
95C (≈ 42)	12	19
<u>SCHOOL TOTAL</u> (≈ 987)	16	21

Table III.7

Study Group Versus Percent of Reported Problems

Study Group	% Reported Problems	
	<u>Test Section Unclear</u>	<u>Test Section Not Job Related</u>
1. SQT, no notice, no study (43)	18	33
2. SQT, notice, no study (121)	18	24
3. SQT, study after (324)	14	17
4. SQT, study before (228)	15	17
5. Scheduled, no notice, no study (20)	09	16
6. Scheduled, notice, no study (40)	15	32
7. Scheduled, study after (55)	15	27
8. Scheduled, study before (32)	06	12
9. No SQT, no notice, no study (88)	21	38
10. no SQT, no notice, study (34)	21	21

The SM and the Job

General trends. Several questions were asked about the relationship between the content of the SM and the soldiers' actual jobs. These questions were:

- Does your SM tell you everything you need to know about how to perform the tasks in your MOS and Skill Level? (PERFORM)
- How many of the tasks in the SM are critical or important for your MOS? (CRIT)
- Are any important tasks for your MOS left out of the SM? (OUT)
- How many of the tasks described in your SM are different from the way you usually do them on the job? (DIFF)
- Have you found any technical errors in your SM? (ERROR)

Problems in these areas have far-reaching consequences, not only with respect to the SMs themselves, but to the soldiers' careers. The role of SMs in the EPMS has been made central: not only does the SM describe the tasks a soldier must know in order to advance, it is supposed to provide him with all the information he would need in order to do his job (if not in terms of complete descriptions, at least in terms of providing sufficient references so that the soldier would know where to find all the information). If tasks are not described adequately, or omitted, or actually described erroneously (or differently from the way the soldier actually performs his tasks), the value of the SM is severely diminished. These issues probably also affect soldiers more subtly; if a soldier considers his SM inaccurate or incomplete in areas that he knows about (i.e., his job), he might tend to doubt its validity or usefulness for everything (e.g., preparing for the SQT, assisting in tasks the soldier knows little about, etc.).

Unfortunately, there were many negative responses to these five questions.* Fully 39% (of 983 respondents) said that the SM does not tell them everything they need to know about their jobs; 15% (of 983) said no tasks or only a few tasks in the SM were critical to their jobs; and 16% (of 987) said tasks were left out. Furthermore, a large majority of respondents (73% of 982) said tasks were described differently in the SM from the way they are actually performed, and 42% (of 935) reported technical errors in the SM.

Schools and MOS. Table III.8 shows the responses to each of these questions as a function of the Proponent Schools and MOSs within Schools. As can be seen, all Schools and practically all MOSs reported significant problems for the PERFORM, DIFF and ERROR questions. Schools substantially above the overall average percentage of problems on PERFORM were the Directorate of Training (47%), the Ordnance Center (47%), and the Aviation Center (52%). Specific MOSs with substantially higher than average PERFORM problems were 19D (48%), 19E (44%), 13E (56%), 16P (49%), 63B (58%), 63C (54%), 63H (47%), 71P (67%), 93H (48%), and 95B (55%). There does not seem to be any particular pattern for either Schools or MOSs. On the other hand, there is a clear pattern for the DIFF question: the MOSs with substantially higher incidence of problems are 19E (92%), the MOSs from the Artillery School (80% for 13B and 13E), the Health Sciences MOSs (76J, 81%), and the MP School MOSs (95B, 90%; and 95C, 95%). We have no obvious interpretation for these high percentages. However, during the data collection interviews with individual soldiers, we found numerous instances of "site-specific" procedures for these MOSs (especially for the MPs and 76J). That is, local procedures had evolved which depended upon particular, somewhat unique, circumstances; these procedures were different than those contained in the SM. Another distinct possibility is that jobs have changed in content since the issuance of the SM.

This last possibility is supported by the data from the ERROR question. The MOSs with the highest reported incidence of errors are 19D, 19E, and 63C. These three (Armor Reconnaissance

*Although not meant to lessen the importance of these results, it should be mentioned that each of these questions has some qualifications. With respect to the PERFORM question, many soldiers would not deem it a drawback if the SM were incomplete. The CRIT and OUT questions depend on the soldiers' judgment of criticality and importance; it is possible that soldiers' criteria for these dimensions could inflate the "negative" scores. For the DIFF question, soldiers responded on a 4-point scale (all are different, most are different, a few are different, none are different); the 73% breaks out as 6% "all," 24% "most," and 42% "a few." Thus, our classification of "a few" as a problem-indicator has "inflated" this overall percentage. Similarly, for the ERROR question a response of "a few technical errors" was included in the "problem" percentage.

Table III.8
SM and Job Problems by School and MOS
(% Reporting Problems)

	Not Tell How to Perform	Tasks Not Critical	Tasks Left Out	Tasks Differ From Job	Errors Warrant in SM
Infantry (≈151)	26	6	12	61	51
11B (≈81)	26	4	15	65	57
11C (≈73)	24	9	11	59	46
Armor (≈62)	47	11	19	32	38
19/11D (≈33)	48	3	26	74	55
19/11E (≈27)	44	15	12	92	59
Artillery (≈148)	39	10	13	80	46
13B (≈79)	25	9	12	80	47
13E (≈63)	56	10	15	80	47
Air Defense (≈146)	40	14	19	66	46
16P (≈57)	49	16	25	73	52
16R (≈32)	36	13	17	63	41
Ordnance (≈123)	47	22	14	77	37
45K (≈17)	12	41	18	71	36
45L (≈8)	--	--	--	--	--
63B (≈35)	58	15	18	74	26
63C (≈24)	54	0	12	83	42
63H (≈34)	47	28	6	30	32
Transportation (≈37)	35	14	3	57	13
57H (≈9)	--	--	--	--	--
64C (≈26)	36	16	4	68	32
Aviation (≈110)	52	20	23	72	32
71P (≈32)	67	9	31	98	26
93H (≈37)	48	22	14	75	50
93T (≈37)	43	24	19	54	27
Aviation (≈22)	35	45	13	57	41
74D (≈16)	31	44	12	60	41
74F (≈3)	--	--	--	--	--
Health Sciences (≈32)	32	23	18	82	30
76C (≈21)	33	24	19	81	32
Quartermaster (≈64)	35	19	15	69	27
76P (≈28)	43	17	14	71	31
76Y (≈37)	30	24	16	71	24
Military Police (≈97)	38	18	18	91	41
95B (≈50)	55	20	24	90	38
95C (≈42)	17	17	12	95	45
<u>SCHOOL TOTAL</u> (≈987)	39	15	16	73	42

Specialist, Armor Crewman, and Track Vehicle Mechanic, respectively) all involve working with vehicles that have undergone substantial changes since 1976 (the approximate date for the issuance of the SMs). This point raises an important issue: the frequency with which the SMs should be revised and/or updated. For the MOSs involving new or updated equipment, it is clear that unless the SM is updated, it will rapidly become obsolete. For other MOSs, the necessity for updating might not be so compelling; however, provisions should be made in the SM production system for rapid revision. One possibility (that may already be in effect) suggests itself immediately: the SMs are produced with hole-punches for loose-leaf binding. It should be relatively easy to add and delete pages as necessary. Thus, a particular School could be geared to provide new material quickly, rather than waiting for periodic large-scale, time-consuming re-editions of the basic SM.

At a different level of analysis, the high incidence of problems in the area of job relatedness might reflect more serious problems than simply outdated material. A few of these problems have been mentioned previously but bear repeating, namely the issues of job relevance and task analysis. With respect to the former, we mentioned that SMs should be written from a user orientation--the writer must consider who will be using the SM, the user's skills and knowledge, and purpose for which the SM will be used. Of course, this is far easier to say than to do. A manual designed for several different purposes must be compromised in certain respects or it will become encyclopedic and unusable for all purposes. As a simple example, consider only the "help-on-the-job" function. What a soldier needs to know varies with his ability level; thus, different soldiers would need different information. This becomes less obvious when it is realized that, at different levels of experience, types of information provided might in fact be inefficient. For example (and completely hypothetically), consider a radar troubleshooter. At a novice level, the troubleshooter would need a detailed, step-by-step exhaustive procedure to isolate, diagnose, and repair malfunctions. However, with some experience on the job, far more efficient strategies develop; information requirements might simply be a "symptoms-by-malfunction" table (which would be incomprehensible to the novice). This example is not presupposing that the SM should be a training handbook, nor that current SMs must be arbitrary with respect to various aspects of content. Apparently, what soldiers have picked up on is the arbitrariness of task description procedures.

One "ideal solution" is probably impossible to implement: SM writers should continuously monitor actual MOSs in operation for new and efficient procedures, new equipment utilizations, etc., and continuously update the SMs. Alternatively (and just as unfeasible), "localized" SMs could be developed to be more job relevant. (This suggestion applies only to the "help-on-the-job" function of SMs; the performance standards, test conditions,

etc., being [in theory] criterion referenced, would not change.) Given these two suggestions are impossible, one practical recommendation is that more emphasis be put on field evaluation of the SMs prior to wide-scale production. Job-incumbent opinions should be solicited, as well as unit level, supervisory personnel opinions, regarding adequacy, accurateness, etc., of any SM or of modifications to an SM.

Rank. In general, incidence of reported problems was fairly consistent across ranks for each of the dimensions in this category. There was a trend for the DIFF and the ERROR problems to increase with rank (i.e., for DIFF, E2=63%, E6=78%, for ERROR, E2=24%, E6=43%). These trends support the previous contentions that two factors which contribute to increased job-SM mismatches are (1) increasing skills of job incumbents, and (2) increasing probability of a soldier having an obsolete SM.

Study Groups. Reported incidences of problems within this category for the different Study Groups are shown below. There do not seem to be any interpretable trends in this breakout.

	<u>PERFORM</u>	<u>CRIT</u>	<u>OUT</u>	<u>DIFF</u>	<u>ERROR</u>
SQT, no notice, no study (N 43)	35	19	18	67	44
SQT, notice, no study (N 122)	42	16	14	81	44
SQT, study after (N 322)	41	17	18	70	44
Scheduled, no notice, no study (N 21)	37	13	18	78	45
Scheduled, notice, no study (N 41)	34	10	15	85	31
Scheduled, study after (N 55)	51	13	11	71	40
Scheduled, study before (N 32)	26	09	16	63	43
No SQT, no notice, no study (N 86)	34	20	10	66	35
No SQT, no notice, study (N 34)	35	08	06	74	36

Changes and Suggestions

Soldiers were asked to answer the following question: "If you could change one thing about your Soldier's Manual, what would it be?" The comments received (from 38.5% of the user sample) could, for the most part, be sorted into seven groups. These groups (and the percentage of soldiers making each comment) are as follows:

1. Make the SM more complete (14.7%)
2. Make the SM more up-to-date (2.4%)
3. Make the SM easier to read or understand (5.8%)
4. Make the SM easier to use or handle (8.4%)

5. Make the SM more accurate and consistent with other documents (2.2%)
6. Make it easier to locate tasks or other information (2.6%)
7. Specific task should be changed (2.4%)

In general, soldiers responded on the basis of other questions they had been asked (e.g., given that they were previously questioned as to the adequacy of the binding, many soldiers responded to the present question by saying, "Make the binding better"). Also, the patterns of comments track fairly well the types of problems reported previously. Thus, the MOSs responsible for most of the "easier to use or handle" responses are the ones with high incidences of problems with the physical characteristics of the SM (11B, 11C, 13B, 16P, 16R). Similarly, most of the "up-to-date" comments were made by MOSs from the Armor and Artillery Schools which parallels their difficulties with the correspondence between SMs and their jobs.

The largest category of suggested changes involved "making the SM more complete." This type of recommendation is encouraging since it suggests that soldiers want (and would presumably make use of) more detailed information about the tasks comprising their MOS. But such a request may be inconsistent with the objectives of the SM program or the fact that all tasks can not be included in SMs and detailed to the level which some soldiers might find desirable.

SUMMARY

Table III.9 presents, in a summary form, the results from the survey of SM characteristics. Entries in this table are for particular SMs for which more than 20% of the subsamples had reported problems. The three summary columns are:

1. The absolute number of problems (as defined above) for each SM.
2. The number of characteristics with reported incidence of difficulties greater than reported by the overall sample; and
3. The number of characteristics with reported incidence of difficulties less than reported by the overall sample.

At a very general level, it appears that there are five SM characteristics of possible critical concern across all MOSs and Schools. These are:

- the binding;
- the lack of job relatedness of the test sections;

[illegible]

- the lack of detail in task descriptions;
- differences between tasks as described in the SM and how they are actually performed on the job; and
- the presence of technical errors in the SM.

We have discussed (in more or less detail) these problems in the previous sections; the only additional comment to add here is that all of these problems (except binding) could conceivably stem from the same sources, namely, inadequate or unvalidated task analyses.

At the individual SM level, certain SMs can be prioritized as candidates for revision. These are:

- 63H
- 76Y
- 76J
- 95B

If we consider the "relative" problem totals (i.e., the last two columns of Table III.9), we would also add the 13E, 45K, and 74D SMs as likely candidates for revision. Interestingly, these "problem" SMs are not School-specific: for example, although the 95B SM has problems, the 95C SM is relatively good. This would suggest that Army-wide policy changes regarding SM development may not be warranted; "good" manuals are being produced at most Schools, with the same Army-wide guidance that has been implemented in the production of "poor" SMs.

Finally, the point needs to be made that, although the emphasis in this report has been on the negative aspects of the SMs, there is ample evidence that the SM plays an important contributory role for many soldiers in developing and maintaining their job skills and knowledge. Our arbitrary "criterion" of 20% of the respondents for the definition of a "problem" is perhaps overly strict; a looser criterion would have resulted in fewer problems reported. The stricter criterion was chosen simply to identify areas in which further improvements might be realized.

IV. SOLDIER'S MANUAL USAGE

DEFINING VARIABLES

A large number of questions in the survey were directed at SM usage. This section will describe the variables that define the concept of usage.

General Usage (USED SM)

Soldiers were asked to respond ("Yes" or "No") to the question, "Have you ever used or tried to use a Soldier's Manual for any purpose since leaving AIT?" If they answered negatively, they were asked to explain why they had not. The general purpose of this question was to identify non-users so that they could be eliminated from further analysis on this topic.

Specific Usages

Soldiers were asked specific usage questions regarding sections or purposes of the SMs. These usages were:

- Common Soldier Tasks (CST): "Have you ever used that part of the SM that covers Common Soldier Tasks? If so, how useful is it?"
- Other Documents (OTHRDOC): "For many tasks, the SM lists other documents which can be used. How often have you looked up other documents listed in your SM?"
- Non-SQT Tasks (NONSQT): "Have you ever used the SM to help you in performing tasks that were not in the SQT?"
- Other Reasons (REAS): "Have you ever used the SM for any other reasons not already noted above?"

SQT Usages

Due to the existing EPMS-SQT-SM structure, it was expected that the principal usage of the SM would be in connection with the SQT. Therefore, several questions were asked to obtain more detailed information.

- Used for SQT (SQTUSE): "Did you use the SM to study for the SQT?"
- Study Length (MONTHS): "How many months did you spend using the SM to prepare for the SQT?"
- Study Habits (HR/WK): "About how many hours per week did you spend using the SM to prepare for the SQT?"
- Specific Study Habits (OFTN): "When training for the SQT, how often did you use the SM?"

1. "How many of these times did you use the SM when asked to by your supervisor?" (SUP)
2. "How many of these times did you use the SM when time was scheduled for its use?" (SCHED)
3. "How many of these times did you use the SM on your own whenever you felt you needed it?" (OWN)

The following sections present descriptive information regarding responses to these questions. It should be noted, however, that the sample of soldiers in this project was originally intended to include a disproportionately large number of troops who:

1. were (or should have been) familiar with the SM;
2. had taken or were about to take SQTs;
3. were of higher rank (i.e., a disproportionately large number of E3s, E4s, and E5s); and
4. were more career-oriented than a randomly-selected sample.

Another consideration is that the questionnaire or interview itself may have created a positive bias; i.e., soldiers might have overreported usage, given that they were part of a "selected" sample and/or because they had just answered a series of questions about training, testing, and their Army careers. Therefore, these data should be viewed primarily as "relative" information, rather than as expressing absolute estimates of usage throughout the Army.

GENERAL USE

Table IV.1 presents a summary information for the first six variables described above as a function of Proponent Schools, MOS, Rank, site (CONUS vs. USAREUR), and overall total. A number of points must be made to clarify this table: Entries in the column labeled USED SM are the proportions of soldiers in the various subsamples (for example, 11Bs) and overall who responded "Yes" to the general usage question. The numbers in parentheses are the sample sizes of those populations included in the study (hence, the total of 1,224 soldiers). The remaining proportions for the other variables in this table are based on the soldiers who responded "Yes" to the general usage question (total N = 1001). For example, consider the first row of entries, the Infantry School. A total of 161 soldiers were included in this subgroup, of whom 95% (i.e., 153) reported using the SM for any purpose. The remaining entries are based on the group of 153; thus, 92% of these 153 (i.e., 142) used the SM to study for the

Table IV.1
General and Specific Usages by Schools and MOSs

School	MOS	USED SM	SQT USE	CST	OTHR DOC	NONSQT	REAS
Infantry		0.95(161)	0.92(153)	0.71(153)	0.84(153)	0.63(151)	0.73(153)
	11B	0.96(78)	0.93(75)	0.71(75)	0.81(75)	0.57(75)	0.79(75)
	11C	0.94(83)	0.91(77)	0.72(78)	0.86(78)	0.68(74)	0.68(78)
Armor		0.91(70)	0.75(61)	0.70(63)	0.82(62)	0.60(58)	0.67(64)
	19/11D	0.90(40)	0.73(33)	0.60(35)	0.91(35)	0.55(31)	0.61(36)
	19/11E	0.93(30)	0.79(28)	0.82(28)	0.70(27)	0.72(25)	0.75(28)
Artillery		0.97(136)	0.99(148)	0.78(148)	0.85(148)	0.46(142)	0.64(151)
	13B	0.95(91)	0.87(85)	0.79(84)	0.86(84)	0.43(75)	0.67(86)
	13E	1.00(64)	0.90(62)	0.79(63)	0.86(63)	0.45(62)	0.59(64)
Air Defense		0.94(161)	0.85(150)	0.79(149)	0.90(146)	0.54(149)	0.58(151)
	16P	0.95(66)	0.94(62)	0.87(62)	0.95(62)	0.57(58)	0.67(63)
	16R	0.93(95)	0.80(88)	0.74(87)	0.86(84)	0.51(83)	0.52(88)
Ordnance		0.68(184)	0.74(124)	0.72(123)	0.72(123)	0.30(121)	0.38(125)
	45K	0.61(31)	0.58(19)	0.82(19)	0.53(19)	0.35(17)	0.37(19)
	45L	0.69(13)	0.89(9)	0.56(9)	0.67(9)	0.25(8)	0.44(9)
	63B	0.69(51)	0.86(35)	0.79(34)	0.80(35)	0.47(34)	0.34(35)
	63C	0.68(38)	0.69(26)	0.76(25)	0.73(26)	0.22(23)	0.54(26)
	63H	0.71(51)	0.71(35)	0.58(36)	0.74(34)	0.18(33)	0.31(36)
		0.45(84)	0.63(38)	0.68(37)	0.65(37)	0.40(35)	0.47(38)
Transportation		0.31(32)	0.40(10)	0.70(10)	0.40(10)	0.25(8)	0.50(10)
	64C	0.54(52)	0.71(28)	0.67(27)	0.74(27)	0.40(25)	0.46(28)
Aviation		0.85(131)	0.76(110)	0.77(111)	0.85(111)	0.32(103)	0.40(111)
	93H	0.93(42)	0.79(39)	0.72(39)	0.85(39)	0.33(36)	0.41(39)
	93J	0.79(47)	0.89(37)	0.68(37)	0.84(37)	0.21(34)	0.24(37)
	71P	0.83(42)	0.59(34)	0.80(35)	0.86(35)	0.41(29)	0.54(35)
Admincen		0.69(32)	0.86(22)	0.55(22)	0.59(22)	0.30(20)	0.09(22)
	74D	0.69(26)	0.83(18)	0.50(18)	0.50(18)	0.27(15)	0.11(18)
Health Sciences		0.76(29)	0.77(22)	0.64(22)	0.64(22)	0.19(21)	0.45(22)
	76J	0.76(29)	0.77(22)	0.64(22)	0.64(22)	0.20(20)	0.45(22)
Quartermaster		0.62(105)	0.63(64)	0.63(65)	0.69(65)	0.40(63)	0.28(65)
	76P	0.66(44)	0.55(29)	0.66(29)	0.69(29)	0.32(28)	0.21(29)
	76Y	0.59(61)	0.69(35)	0.61(36)	0.69(36)	0.47(36)	0.33(36)
Military Police		0.91(108)	0.85(98)	0.78(98)	0.76(98)	0.35(96)	0.53(98)
	95B	0.87(61)	0.79(53)	0.81(53)	0.81(53)	0.37(49)	0.57(53)
	95C	0.96(47)	0.91(45)	0.76(45)	0.69(45)	0.38(42)	0.49(45)
Rank	2	0.61(40)	0.26(27)	0.59(27)	0.52(27)	0.46(26)	0.29(28)
	3	0.68(134)	0.72(90)	0.64(91)	0.67(91)	0.38(86)	0.40(91)
	4	0.78(396)	0.79(302)	0.73(305)	0.74(303)	0.44(292)	0.49(307)
	5	0.87(356)	0.98(308)	0.73(307)	0.84(307)	0.42(302)	0.58(311)
	6	0.93(259)	0.87(241)	0.80(240)	0.88(238)	0.53(234)	0.62(242)
	7	0.74(19)	0.71(14)	0.79(14)	1.00(14)	0.17(12)	0.50(14)
		0.79(806)	0.81(631)	0.73(628)	0.83(628)	0.45(609)	0.52(633)
CONUS		0.79(806)	0.81(631)	0.73(628)	0.83(628)	0.45(609)	0.52(633)
USAREUR		0.88(418)	0.82(359)	0.74(364)	0.75(360)	0.45(351)	0.56(368)
OVERALL		0.82(1224)	0.81(990)	0.74(992)	0.80(988)	0.45(960)	0.53(1001)

SQT. Hence, all numbers in parentheses refer to the actual number of soldiers "eligible" to respond as a function of the general usage question.*

Looking at the USED SM (general usage) column first, two clear patterns emerge. First, there are large differences among the MOS and Schools; and second, there is an orderly increase in usage as rank increases. Regarding the first pattern, there is a sharp division in general usage between the Combat MOSs (Infantry, Armor, Artillery, and Air Defense) and the Noncombat MOSs, with the former showing substantially higher usage. Those four Schools have an overall usage of approximately 95%, compared to a combined 71% for all other Schools (the MPs, with a reported usage greater than 90%, are the only exception to this generalization). It is difficult to determine the cause of this phenomenon; one possible explanation is that, for the most part, the combat specialties are the MOSs which do not perform their "real" jobs most of the time. They are limited in the amount of actual practice they can accomplish, especially in circumstances relevant to combat job performance. Furthermore, perhaps more than other MOSs, these combat specialties feel the need to become proficient at their "real" jobs, given their roles under actual combat circumstances. Thus, they are likely to use the SM as a source of information in order to train, or simply to find out what tasks they would be responsible for in combat. Apparently, the SM (at least conceptually) fulfills this need. As additional support for his argument, the table also shows that USAREUR has a higher reported usage of the SM than CONUS. These "front line" troops perhaps also feel the need to become proficient, due to their proximity to potential combat zones. Another possible explanation for the relatively higher reported use of SMs among the Combat Arms and MPs is that these soldiers have been exposed to the SQT program for a longer period of time; consequently, more of them may have in fact taken SQTs. More will be said about this hypothesis under the SQT use heading.

The other general usage pattern mentioned above was the orderly increase in usage with rank. The most straightforward explanation of this relationship is simply that the longer a soldier is in the Army, the more chance he has of coming across, obtaining, or using an SM. However, this is probably an oversimplification of what is happening. From the information we gathered concerning the availability and distribution of SMs, we believe that all soldiers (regardless of rank) have an equal opportunity to obtain or use an SM. We would like to think, therefore, that the longer a soldier is in the Army, the more he perceives the value of using his SM, particularly as it enables him to advance through the EPMS.

*Remaining discrepancies are due to missing data. For example, although 153 Infantry School soldiers should have responded to the NONSQT question, we have information from only 151.

SPECIFIC USAGES

SQT Use

Due to the critical role that the SM is presumed to play in SQT preparation it is somewhat surprising that the proportions in the SQTUSE column are not higher. This variable reflects the proportion of soldiers (of those who used the SM for any purpose) who used the SM to prepare for the SQT. Upon further analysis, however, it is clear that the SQTUSE variable tracks the actual proportion of soldiers who took the SQT. This relationship is shown in the following diagram, which indicates the proportions of soldiers who took the SQT, used the SM at all, and used it to prepare for the SQT.

TOOK SQT 808 (66%)		DID NOT TAKE SQT 415 (34%)	
Use SM? yes 728 (90%)	Use SM? no 80 (10%)	Use SM? yes 272 (66%)	Use SM? no 143 (34%)
Use SM for SQT? yes no 645 (89%) 83 (11%)		Use SM for SQT? yes no 159 (58%) 113 (42%)	

The above diagram shows that, of soldiers who took an SQT (66% of our sample), 90% made general use of the SM, and 89% of those used the SM in preparing for the SQT. Of those who reported not yet having taken the SQT (34% of our sample), only 66% reported having used the SM at all. Some of these non-SQT users are certainly those who are preparing for an upcoming SQT (i.e., the 58% who reported using the SM to study for the SQT).

A possibly important finding is the extremely low percentage of E2s who have used the SM to prepare for the SQT. While this is in part due to low percentages of E2s who have taken the SQT, it may also reflect a potentially serious problem in introducing soldiers to the EPMS.

The simplest statement that can be made is that the SQT is a major factor in determining SM use. The large majority of soldiers who have taken an SQT have used the SM (although not all of them used the SM to study for the SQT). Likewise, if a

soldier has not taken an SQT, the probability of his or her having used the SM drops significantly.

Common Soldier Task and Other Document Use

For the CST variable, general usage is quite high (74% of all soldiers who used the SM at all used the CST section) and fairly uniform across MOSs, Schools, and ranks. As shown in Table IV.1, the range of usage is between 55% (Admincen) and 79% (Air Defense and Military Police) at the School level, and between 50% (74D) and 87% (16D) at the MOS level. CST usage tends to increase with rank.

The OTHRDOC usage (Table IV.1) was also surprisingly high, with overall usage at 80%. In general, the pattern of usage follows the general usage (USED SM), and also parallels the incidence of SQT taken. That is, for MOSs and Schools with smaller numbers of soldiers having taken the SQT, OTHRDOC usage is also lower. There was an interesting situation that was uncovered during data collection involving the Aviation MOSs (93H, 93J, and 71P) and the use of these documents: these personnel are required to follow FAA rules and procedures in their jobs. Hence, they are practically forced to use other documents. These other documents are referenced in the SM and, as reflected in Table IV.1, the incidence of referral to them is quite high. OTHRDOC usage also tends to increase with rank.

In addition to answering the use-nonuse questions regarding the Common Soldier Task and reference list sections of the SM, soldiers were asked to rate the usefulness of these components. Soldiers rated the usefulness of the CST sections in the SM along a 4-point scale, from 4 ("very useful") to 1 ("not useful"). The OTHRDOC variable was rated on a 3-point scale, from 3 ("looked up other documents very often") to 1 ("looked up other documents once or a few times"). The ratings (Table IV.2), which were given by those soldiers who used the CST section, are surprisingly high: the overall mean rating is 3.26 (with a 4.00 as maximum). Only the Aviation School (71P and 93J) and the 13E MOS gave mean ratings of less than 3.00. In a sense, this uniformity of opinions could be expected, since the tasks are "common" to all soldiers.

Ratings with respect to OTHRDOC, however, are quite low (Table IV.2) for all MOSs and Schools, with a range of 2.00 (57H) down to 1.36 (63H) for MOSs with more than 20 respondents, and from 1.83 (Air Defense) to 1.52 (Infantry) for Schools. It should be noted, however, that this particular question is difficult to interpret as a criticism of the SM. It is moot whether an SM is good or bad if soldiers don't use the references listed or don't find these references useful. If the SM is self-contained and/or self-explanatory, no other documents should be needed. On the other hand, high ratings and high usage could reflect an excellent, efficiently-organized document system.

Table IV.2 CST and OTHRDOC Ratings

<u>School & MOS</u>	<u>CST</u>	<u>OTHRDOC</u>
Infantry	3.24 (109)	1.52 (128)
11B	3.35 (53)	1.49 (61)
11C	3.15 (56)	1.54 (67)
Armor	3.39 (44)	1.73 (51)
19/11D	3.23 (21)	1.63 (32)
19/11E	3.59 (25)	1.89 (19)
Artillery	3.22 (116)	1.69 (126)
13B	3.42 (66)	1.73 (72)
13E	2.92 (49)	1.64 (54)
Air Defense	3.33 (118)	1.83 (131)
16P	3.32 (54)	1.97 (59)
16R	3.34 (64)	1.70 (72)
Ordnance	3.34 (88)	1.54 (88)
45K	3.37 (16)	1.41 (10)
45L	3.60 (5)	1.33 (6)
63B	3.41 (27)	1.67 (28)
63C	3.26 (19)	1.68 (19)
63H	3.29 (21)	1.36 (25)
Transportation	3.36 (25)	1.62 (24)
57H	3.29 (7)	2.00 (4)
64C	3.39 (18)	1.55 (20)
Aviation	2.98 (85)	1.69 (94)
71P	2.86 (28)	1.70 (30)
93H	3.15 (28)	1.88 (33)
93J	2.86 (28)	1.48 (31)
Admincen	3.31 (12)	1.69 (13)
74D	3.56 (9)	1.34 (9)
Health Sci. (76J)	3.27 (14)	1.70 (14)
Quartermaster	3.40 (41)	1.61 (45)
76P	3.55 (19)	1.55 (20)
76Y	3.23 (22)	1.65 (25)
Military Police	3.30 (77)	1.62 (74)
95B	3.33 (43)	1.68 (43)
95C	3.30 (34)	1.58 (31)
Rank	3.39 (16)	1.21 (14)
2	3.20 (58)	1.52 (61)
3	3.18 (222)	1.51 (225)
4	3.23 (225)	1.68 (258)
5	3.40 (192)	1.88 (210)
6	3.25 (11)	1.57 (14)
7		
CONUS	3.30 (461)	1.67 (519)
USAREUR	3.22 (269)	1.60 (270)
OVERALL	3.26 (730)	1.65 (789)

Non-SQT and Other Uses

Soldiers were asked if they ever used the SM for other than SQT-related tasks. Table IV.1 shows the responses to this question under the NONSQT heading. As can be seen, usage in this area was relatively higher in Combat MOSs (Infantry, Armor, and Air Defense, with Artillery slightly above the overall mean of 45%). This finding may be interpreted by hypothesizing that these soldiers perceived the SQT as containing only a small sample of tasks from their jobs (and from those described in their SMS); thus, the SM would have more non-SQT applicability. Another simple interpretation of these findings is just that soldiers in the Combat MOSs use their SMS on the job more than do those in Noncombat MOSs.

Finally, soldiers were asked if they used the SM for any other reasons not previously mentioned. Again, Table IV.1 shows that the Combat MOSs reported substantially more "other uses" than the Noncombat MOSs. Also, "other uses" increased as a function of Rank (excluding the small sample of E7s) from 29% for the E2s, to 62% for the E6s.

With respect to these "other uses," we were able to sort most of the responses into five categories:

- used the SM to train others;
- used the SM to settle technical arguments;
- used the SM to help on the job;
- used the SM to prepare for classes; and
- used the SM as a general reference.

Unfortunately, of the 533 soldiers who responded positively to this question, 150 (28.1%) did not state the specific nature of the other usage. Of the remaining respondents, 44.4% used the SM to train others, 19.1% used the SM to settle arguments, 7.6% used the SM to help on the job, 12.8% used the SM to prepare for classes, 10.4% used the SM as a general reference, and 5.7% of the responses were unclassifiable.

The following table indicates the predominant or modal "other usages" within MOSSs:

Other Usages					
	<u>Train Others</u>	<u>Settle Arguments</u>	<u>Help On Job</u>	<u>Prepare for Class</u>	<u>General Ref.</u>
11B	✓			✓	11B
11C	✓	✓			11C
11D	✓	✓			11D
11E	✓				11E
13B	✓	✓			13B
13E	✓	✓			13E
16P	✓	✓			16P
16R	✓	✓			16R
45K			✓		45K
63B					✓ 63B
63C	✓	✓			63C
63H	✓				63H
64C				✓	64C
71P					✓ 71P
76J	✓				76J
76P	✓			✓	76P
76Y	✓				76Y
93H	✓	✓			93H
93J	✓		✓	✓	✓ 93J
95B	✓				✓ 95B
95C	✓				95C

These other usages map logically onto Rank, as shown in the following table (entries are now percentages):

% Reporting					
<u>Rank</u>	<u>Train Others</u>	<u>Settle Arguments</u>	<u>Help On Job</u>	<u>Prepare for Class</u>	<u>General Ref.</u>
2 (N=28)	0	7.1	0	7.1	7.1
3 (N=91)	3.3	9.9	4.4	2.2	5.5
4 (N=307)	10.1	10.7	3.9	5.9	3.3
5 (N=311)	19.6	6.1	2.3	5.5	3.2
6 (N=242)	28.5	4.1	2.1	3.7	5.0
7 (N=14)	28.6	0	7.1	0	0

Thus, the use of the SM as a training aid increases with rank; also, the use of the SM to settle arguments is primarily confined to the lower ranks (E2-E4).

SQT USAGES

Given that the SQT appears to be the primary stimulus for SM use, several questions were asked of soldiers in order to probe this relationship. Table IV.3 shows the summary data for these questions. The following notes apply to the entries in this table:

1. MONTHS. The numbers given in the table refer to the number of months soldiers reported using the SM to prepare for the SQT. Scale values are actual months up to 3; anyone who reported using the SM for more than three months was assigned a scale value of 4. The number in parentheses is the number of soldiers who indicated they had used the SM to study for the SQT.
2. HR/WK. Soldiers who responded to this question (numbers in parentheses) were assigned values along a 7-point scale: 1 = 1 to 5 hours per week (using the SM to study for the SQT); 2 = 6 to 10 hrs./wk.; 3 = 11 to 15 hrs./wk.; 4 = 16 to 20 hrs./wk.; 5 = 21 to 25 hrs./wk.; 6 = 26 to 30 hrs./wk.; and 7 = more than 30 hrs./wk. The primary reason for scaling the two variables above was due to a few extreme values on each dimension. For example, one soldier reported using the SM for studying for 108 months; another claimed he used it 70 hours per week. These scores would have significantly altered the mean values, around which there otherwise was relatively little variance.
3. OFTN. Responses of soldiers to this question (numbers in parentheses) were assigned values along a 4-point scale, where 1 = not very often, 2 = some, 3 = quite a bit, and 4 = a lot.
4. SUP, SCHED, OWN. These three variables, wherein a soldier reported the primary reasons for using the SM in preparation for the SQT (respectively, when asked by the supervisor, when scheduled for use, and on his own) were each assigned values along a 3-point scale, where 0 = never, 1 = some, and 2 = most of the time.

Table IV.3 shows a uniformity of responses for the MONTHS variable across all Schools, with a small range of 2.00 (MP) to 2.36 (HEALTH SCIENCE). This is due, for the most part, to the Army-wide policy of announcing upcoming SQTs with approximately a three-month lead time. Although many soldiers do not exclusively tie use of their SM to the SQT Notice (see discussion concerning Study Groups elsewhere in this report), most concentrated study

Table IV.3

SQT Usages

School	MOS	MONTHS	HR/WK	OFTN	SUP	SCHED	OWN
Infantry		2.19(124)	3.13(133)	2.76(139)	1.22(140)	1.19(140)	1.40(140)
	11B	2.21(64)	3.28(69)	2.76(80)	1.19(70)	1.27(70)	1.43(70)
	11C	2.19(60)	2.97(64)	2.75(69)	1.26(70)	1.10(70)	1.37(70)
Armor		2.28(43)	2.64(42)	3.04(45)	1.31(45)	1.11(45)	1.22(45)
	19/11D	1.97(24)	3.38(21)	3.04(23)	1.30(23)	1.09(23)	1.13(23)
	19/11E	2.68(19)	1.90(21)	3.05(22)	1.32(22)	1.14(22)	1.32(22)
Artillery		2.26(122)	2.35(125)	2.68(129)	1.05(130)	1.05(130)	1.44(130)
	13B	2.08(70)	2.39(71)	2.84(73)	1.14(73)	1.12(73)	1.37(73)
	13E	2.47(51)	2.32(53)	2.47(55)	0.93(56)	0.93(56)	1.54(56)
Air Defense		2.30(101)	2.18(119)	2.57(127)	1.11(128)	1.14(128)	1.37(127)
	16P	2.27(48)	2.38(55)	2.68(57)	1.21(58)	1.21(58)	1.32(57)
	16R	2.31(53)	2.02(64)	2.57(70)	1.03(70)	1.01(70)	1.41(70)
Ordnance		2.25(81)	1.58(81)	2.21(90)	0.66(91)	0.68(91)	0.45(91)
	45K	1.72(11)	1.45(11)	2.09(11)	0.73(11)	0.82(11)	1.27(11)
	45L	1.67(6)	1.40(5)	2.63(8)	0.50(8)	0.63(8)	1.38(8)
	63B	2.53(26)	1.48(27)	2.24(29)	0.45(29)	0.42(29)	0.62(29)
	63C	1.90(20)	2.00(15)	2.50(18)	0.61(18)	0.78(18)	1.50(18)
	63H	2.78(18)	1.52(23)	1.38(24)	0.96(25)	0.98(25)	1.32(25)
Transportation		2.21(22)	1.74(19)	2.55(24)	0.40(20)	0.85(20)	1.35(20)
	57H	2.29(7)	2.00(3)	3.00(3)	1.00(3)	1.33(3)	1.67(3)
	64C	2.18(15)	1.69(16)	2.47(17)	0.29(17)	0.76(17)	1.29(17)
Aviation		2.35(79)	1.47(83)	2.41(82)	0.51(84)	0.64(84)	1.50(84)
	71P	2.05(18)	1.53(19)	2.40(20)	0.40(20)	1.50(20)	1.35(20)
	93H	2.46(28)	1.48(31)	2.58(31)	0.65(31)	0.87(31)	1.61(31)
	93C	2.42(33)	1.42(33)	2.26(31)	1.45(33)	0.52(33)	1.48(33)
Engineering		2.35(17)	1.47(17)	2.21(19)	0.53(19)	0.58(19)	1.52(19)
	74D	2.14(14)	1.46(13)	2.07(15)	0.67(15)	0.73(15)	1.40(15)
Health Sciences	76J	2.36(14)	1.31(16)	2.53(17)	0.76(17)	1.00(17)	1.24(17)
Quartermaster		2.16(35)	1.68(37)	2.40(40)	0.50(40)	0.60(40)	1.40(40)
	76P	2.41(15)	2.00(14)	2.69(16)	0.56(16)	0.50(16)	1.44(16)
	76Y	2.01(20)	1.48(23)	2.21(24)	0.46(24)	0.67(24)	1.39(24)
Military Police		2.00(72)	1.62(79)	2.39(79)	1.77(80)	1.82(80)	1.40(80)
	95B	1.97(36)	1.63(40)	2.20(40)	0.66(41)	0.66(41)	1.46(41)
	95C	2.02(36)	1.61(38)	2.59(39)	0.90(39)	1.03(39)	1.33(39)
Parks	2	1.71(7)	2.50(6)	2.33(6)	0.71(7)	1.00(7)	1.43(7)
	3	2.08(54)	2.24(58)	2.10(62)	0.81(64)	0.81(64)	1.29(63)
	4	1.99(215)	2.19(213)	2.34(232)	1.01(233)	1.96(233)	1.24(233)
	5	2.39(241)	2.09(259)	2.66(267)	0.94(269)	0.03(269)	1.42(269)
	6	2.41(185)	2.09(203)	2.80(207)	0.79(208)	0.84(208)	1.62(208)
	7	1.29(7)	1.75(8)	2.30(10)	1.00(10)	1.00(10)	1.40(10)
TOTAL		2.23(712)	2.13(751)	2.55(798)	0.91(795)	0.94(795)	1.41(794)
ADMS		2.19(469)	2.13(481)	2.52(504)	0.85(505)	0.93(505)	1.46(504)
SEALIF		2.34(243)	2.13(270)	2.61(284)	1.02(290)	0.97(290)	1.32(290)

begins with the arrival of the Notice. More experienced soldiers (Ranks E5 and E6) apparently start studying sooner than less experienced troops (or at least say they do).

There are, however, some larger differences at the MOS level, with longer than average study times reported by 19E, 13E, 63B, 63H, and 76P. Shorter than average study times were reported by 19D, 45K, 45L, 63C, and 95B. We have no further information regarding possible causes of these differences; however, it might be that, for these latter MOSs, the SQT Notice was released at a time closer to the actual SQT administration than for the former.

The HR/WK variable (which, due to our scale conversion, can be interpreted as hours per day spent using the SM to prepare for the SQT) shows substantial differences among the different Schools and MOSs. Again, it appears that troops from the Combat MOSs (Infantry, Armor, Artillery, and Air Defense) spent substantially more time using the SM to prepare for the SQT than did those in the Noncombat MOSs. Potential reasons for this difference will become apparent when the remaining variables (SUP, SCHED, and OWN), which describe the patterns of use, are discussed below. (The OFTN variable does not show any differences among Schools and MOSs and will not be discussed further.)

These three variables (SUP, SCHED, and OWN) indicate relatively how often soldiers used the SM to study for the SQT when requested to by their supervisor, when scheduled, and on their own initiative. As Table IV.3 shows, it is clear that for the Combat Schools, substantially more use occurs as a function of supervised and scheduled study than for the Noncombat Schools. It might be the case that more units (at the company level) within these Combat MOSs have regularly scheduled, formal SQT preparation classes. Alternatively, Company Commanders and/or Platoon Leaders (i.e., whomever is ultimately responsible for SQT preparation) for Combat MOSs may place a higher priority on SQT preparation than in other MOSs, or they may consider the SM a good resource for this purpose. Whatever the reason, SM usage for SQT preparation seems to be a function of, or be influenced by, higher-level decisions; the Combat-Noncombat distinction does not hold up for the frequency of use on the soldier's own initiative; there are no differences for the OWN variable across Schools.

Looking at this from another perspective, use of the SM to prepare for the SQT in Noncombat MOSs appears to be a function of the individual soldier's initiative: the OWN variable is substantially higher than SUP or SCHED for all these MOSs. Perhaps soldiers in these MOSs turn to the SM because less "official" (i.e., SUP and SCHED) support for SQT preparation is present. In this regard, the results by rank are interesting: despite only minor variations in SUP and SCHED across ranks, the higher ranks (E5, E6, and E7) use the SM on their own initiative

more frequently than lower ranks (E3 and E4). Again, it seems as if more experienced soldiers perceive the need for using the SM and do not need to be told to use it.

USAGE INDEX

The sections above present descriptive information regarding 12 specific usage variables. Partially as a summary characterization of SM usage, and partially to simplify further correlational analyses, a Usage Index was created. This Index combines most of the usage variables into a single scale value in an additive fashion. Briefly, the steps undertaken to generate this Index were as follows:

1. Initially, all of the variables discussed above were intercorrelated in their original form (e.g., with scaled variables retaining their numerical values).
2. Several statistical techniques were employed to assess the internal consistency (i.e., reliability) of the variable set. (For example, each variable was correlated with the composite Usage Index; overall alpha coefficients were generated with and without each variable, etc.).
3. Different combinations of variables and different combinational rules were tried iteratively in an attempt to maximize the internal consistency of the Index.

The results of these steps is an Index composed of eleven usage variables, combined additively. Several of these variables (specifically, those with possible values greater than 1.0) have been normalized so that all variables take on values between 0.0 and 1.0. Thus, the Usage Index has a theoretical minimum of 0.0 and a maximum of 11.0. As a result of the internal consistency analyses, the "use of the SM for non-SQT tasks" variable has been excluded from the Usage Index. The remaining variables each correlate significantly with the overall Index; each accounts for some unique variance; and each raises the overall alpha (interpretable as an internal reliability coefficient).

The intercorrelations among the variables in the Usage Index are shown in Table IV.4, along with the correlations between each variable and the Usage Index.* As might be expected, the variable with the most "weight" is whether the SM was used to study for

*Some caution must be given to a direct interpretation of these correlations, in that all of the variables are not independent. Specifically, if a soldier has not used the SM at all, he will have zeros for all variables. Likewise, if he has not used the SM to study for an SQT, certain other variables are, perforce, zero. Thus, the magnitude of the correlations is overestimated.

Table IV.4 Intercorrelations Among Usage Variables¹

USAGE INDEX	USED AT ALL	USED FOR SQT	CST	OTHR DOCS	OTHR RSNS	MNTHS	HRS / WK	OFTN	SUP	SCHED	OWN
USED AT ALL	66										
USED FOR SQT	83	65									
CST	53	53	44								
OTHER DOCS	58	51	48	41							
OTHER REASONS	48	41	38	34	38						
MONTHS	51	35	50	27	37	26					
HOURS/WEEK	60	38	58	29	34	28	37				
OFTEN	81	52	79	44	53	40	52	64			
SUP	59	36	55	32	29	31	30	45	55		
SCHED	60	37	56	33	32	33	27	46	56	72	
OWN	69	51	77	40	45	35	47	46	69	34	38

¹ Entries are Pearson Product-Moment correlations, rounded to the nearest hundredth; decimals omitted.

the SQT. However, as was noted above, each of the other variables (including the non-SQT usages) significantly correlates with both the overall Index and the other variables in the set. An implication of this is that although SQT use probably determines the general range of a soldier's Index score, the other variables enable further, finer discriminations among soldiers.

With respect to the Index itself, Table IV.5 presents descriptive statistics, broken down by MOS and Rank. This table illustrates clearly some of the general trends commented on in previous sections. For example, the Combat Arms MOSs have substantially higher mean Index scores than Noncombat MOSs (with certain exceptions, to be discussed below). Practically all of these other MOSs show highly skewed Index scores, with modal values equal to zero (i.e., a preponderance of non-SM users). Within the Combat Arms MOSs, the 19D and 16R positions have slightly lower scores than others.

For Noncombat MOSs, exceptions to the generally low scores are the Aviation MOSs (especially 93H) and the Military Police MOSs (especially 95C). The general trend of increasing usage with increasing rank is also reflected in the table.

Given these findings regarding the internal consistency of the Usage Index, the Index was considered as an appropriate criterion variable for correlational analyses. There were two major types of analyses conducted. The first was an examination of the zero-order correlations between the Background and Usage variables. The second was a series of multiple regression analyses, which attempted to isolate covariates of the Usage Index. Before presenting those results, the variables used as correlates will be briefly described.

BACKGROUND VARIABLES

Previous sections of this report (see Chapter II) have presented and discussed these background variables. As a convenience to the reader, descriptive information about them is summarized in Table IV.6. These variables represent various aspects of a soldier's personal history, Army and job experience, attitude, SM experience, and SQT history. This variable set is, in fact, a subset of the entire collection of background variables presented in Chapter II. The choice of this particular subset was based on several considerations, including theoretical and practical considerations of meaningfulness and potential utility, descriptive statistics (including distributional characteristics), and examinations of background variable intercorrelations.

Table IV.5
Descriptive Statistics for the Usage Index

		N	\bar{X}	S.D.	MAX.	MIN.	Median (Nearest Integer)	Mode ¹
Infantry	11B	78	6.80	2.30	10.33	0	9	9.1
	11C	83	6.22	2.47	10.05	0	7	7.1
Armor	19D	40	4.90	3.11	9.76	0	5	2, 7
	19E	30	6.00	3.06	9.20	0	7	8
Artillery	13B	91	6.15	2.66	10.29	0	7	7.1
	13E	64	6.27	2.20	10.71	1.25	6	5.1
Air Defense	16P	66	6.68	2.31	10.43	0	7	8.1
	16R	95	5.39	2.69	10.57	0	6	7.1
Aviation	45K	31	2.68	2.74	7.24	0	2	0(12)
	45L	13	3.61	2.83	7.79	0	4	0(4)
	63B	51	3.72	2.94	8.61	0	5	0(12)
	63C	38	3.54	3.19	8.79	0	0	0(24)
	63H	51	3.28	2.76	8.23	0	3	0(15)
Transportation	57H	32	1.24	2.42	9.29	0	0	0(22)
	64C	32	2.46	2.85	7.99	0	1	0(24)
Aviation	71P	42	3.75	2.51	8.71	0	4	3, 4
	93H	42	5.26	2.61	9.64	0	6	6
	93J	47	4.25	2.66	8.39	0	5	6
Administer	74D	26	3.28	2.67	8.56	0	4	0(8)
	74F	6	3.91	3.07	6.79	0	6	0, 6
Health Sciences	76C	29	3.98	3.24	10.14	0	4	0(17)
Mastermaster	76P	44	2.76	2.63	7.79	0	2	0(15)
	76Y	61	2.64	2.76	7.64	0	1	0(25)
Military Police	95B	61	4.74	2.68	9.79	0	5	6
	95C	47	3.69	2.24	9.57	0	6	"
Rank	0	46	1.78	2.18	8.91	0	1	0(18)
	3	134	3.28	2.94	9.83	0	3	0(43)
	4	396	4.20	2.97	9.99	0	5	0(89)
	5	356	5.45	2.38	10.27	0	6	"
	6	239	5.98	2.63	10.71	0	6	6
	7	19	3.90	3.03	8.48	0	5	0(5)
OVERALL		1224	4.73	3.03	10.71	0	5	0(223)

¹Numbers in parentheses are the actual number of soldiers reporting no usage.

Since MCSs had 2 modes, as in 19D.

Table IV.6

DESCRIPTIONS AND DESCRIPTIVE STATISTICS OF BACKGROUND VARIABLES¹

Variable	N	\bar{X}	Sd.	Min.	Max.
Age (months)	1218	35.4	5.03	18.2	49.8
Education	1222	2.25	0.65	1	5
Rank	1219	4.56	1.14	1	7
Skill level	1224	1.87	0.83	1	4
Time in Army	1219	62.9	51.6	3	338
Time in Unit	1210	17.5	13.6	0	97
Time in MOS	1214	43.2	35.0	0	230
Job Time	1224	2.68	1.31	1	5
Time to go (months)	1216	23.1	15.2	0	65
Re-enlist	1214	2.07	0.84	1	3
Likes Job	1216	0.67	0.47	0	1
Remain	1198	1.46	0.50	1	2
Have an SM	1216	1.11	0.89	0	5
AW Help	1192	3.65	1.60	1	5
IST	1213	2.04	0.73	1	3
Not IST	1193	2.27	0.74	1	3
SPT-IST	772	2.23	0.89	1	4
Taken SPT	1223	1.34	0.47	1	2
AIT Notice Help	1203	1.59	0.49	1	2
AIT Help Useful	483	1.64	0.60	1	3
Prepare	925	1.28	0.45	1	2
Equipment	923	1.41	0.49	1	2
Documents	862	1.26	0.44	1	2

¹ Description on following pages.

Table IV.6 (cont.)

Variable Name	Description	Scale Values
Age	Age in months	months
Education	Level of education completed	1 = not high school graduate 2 = high school graduate 3 = some college 4 = college graduate 5 = study beyond college
Rank	Rank	1 = E1....7 = E7
Skill level	Skill level in current MOS	1 through 4
Time in Army	Months on active duty	months
Time in Unit	Months in current unit	months
Time in MOS	Months held current MOS	months
Job time	Proportion of time soldier works in MOS	1 = all 2 = most 3 = half 4 = a little 5 = none
Time to go	Months until ETS	months
Re-enlist	Re-enlistment plans	1 = yes 2 = don't know 3 = no
Likes job	Does soldier like MOS?	0 = no 1 = yes
Remain	Does soldier want to stay in MOS?	1 = yes 2 = no
Have an SM	Does soldier have an SM now?	0 = no 1 = yes 2 = has 2 3 = has 3 4 = has 4 or more 5 = has from another MOS
SM help	Receive help on use of SM	1 = very useful 2 = somewhat useful 3 = not very useful 4 = useless 5 = no
IJT	Receive IJT in MOS	1 = yes, a lot 2 = yes, a little 3 = no
Not IJT	Receive IJT not related to MOS	1 = yes, a lot 2 = yes, a little 3 = no
Not-IJT	Proportion of tasks on SQT in IJT	1 = all 2 = most 3 = a few 4 = none

Table IV.6 (cont.)

Variable Name	Description	Scale Values
Taken SQT	Has soldier taken an SQT?	1 = yes 2 = no
SQT notice help	Receive help on use of SQT Notice	1 = yes 2 = no
SQT help useful	Was help on use of SQT Notice useful?	1 = very useful 2 = somewhat useful 3 = not useful
Prepare	Did soldier have enough time to prepare for SQT?	1 = yes 2 = no
Equipment	Equipment available to study for SQT	1 = yes 2 = no
Documents	Documents available to study for SQT	1 = yes 2 = no

Zero-Order Correlations

As a preliminary step to the regression analyses, the intercorrelations among the background variables and the usage variables were generated. These correlations are shown in Table IV.7. Also shown in this table are the correlations between the background variables and the Usage Index.

Before discussing these correlations, a number of cautions must be given which apply not only to this matrix but to any large set of correlations. First, "statistical significance" is practically meaningless; with Ns of over 1200, correlations greater than + .05 are significantly different from zero. A more realistic "feel" for the true relationships can be achieved by squaring the correlations, thus getting an estimation of the variance accounted for by an individual variable. Also, the variables along both axes are not independent and hence do not have "independent" correlations. For example, a positive relationship between Skill Level and SM usage quite probably is the different reflection of the same relationship (usage as a function of experience). Typically, this issue is resolved by factor-analytic techniques, which "reduce the order" of the correlation matrix. We have not employed these techniques for several technical and practical reasons. First, although we are cognizant of the "independence" problem, individual pair-wise correlations may be of practical importance in terms of what the Army has control over. Second, based on previous analyses and as previously argued, the specific usage variables are internally consistent; they each contribute to measurements of the construct of "Usage." A factor analysis would reveal substantial commonality within this set; but collapsing these variables would lose substantial information. Furthermore, the Usage Index reflects the commonality of the variables, and the Index is included in the correlation matrix. Finally (and with the benefit of hindsight), the results indicate that an "eyeball" factor analysis of the background variables is sufficiently meaningful so that it is unnecessary to conduct a more formal analysis.

As shown in Table IV.7 the first "cluster" of variables which seems to covary with SM usage is the "Army experience" set: rank, Skill Level, time in the Army, and time in MOS. More experience is generally related to higher usage, especially with respect to use for the SQT (use on the soldier's own initiative to study for the SQT, how often the SM is used for studying). Also, more experience is related to greater use of other documents referenced in the SM.

A second "cluster" of interest is the "attitude" set. These variables (time to go, reenlist, like job, remain, and perhaps time spent actually working in one's MOS) surprisingly have little or no relation to SM usage in our sample. One obvious hypothesis was that "better" attitude would result in higher usage; this is apparently not the case. One counterhypothesis is that SM usage

Table IV.7 Intercorrelations of Background and Usage Variables.¹

	CLASS INDEX	USED AT ALL	USED FOR SQT	CST	OTHR DOCS	OTHR RSNS	MNTHS	HRS / WK	OTHR	SUP	SCHED	OWN	NON-SQT ²
AGE (1212)	16	08	14	10	22	10	15	06	16	00	03	20	-03
EDUCATION (1222)	13	10	09	11	12	07	10	04	10	04	06	15	00
RANK (123)	14	23	30	22	31	22	23	17	32	14	16	32	-05
SKILL LEVEL (1234)	18	19	23	18	29	17	20	14	28	08	11	29	-04
TIME IN ARMY (1219)	21	12	16	14	24	13	15	10	19	05	07	23	-01
TIME IN UNIT (1210)	09	05	10	06	04	05	10	05	12	05	02	09	00
TIME IN MOS (1214)	21	10	17	14	22	17	15	12	21	07	09	22	-06
JOB TIME* (1214)	11	08	12	06	12	06	10	06	09	06	08	13	03
TIME TO GO (1216)	08	02	04	06	13	06	12	-01	08	-03	01	09	-01
RE-ENLIST* (1214)	16	09	12	09	17	12	16	08	16	00	05	18	-02
LIKES JCA (1216)	06	06	06	05	09	01	12	-01	04	-06	-04	09	02
REMAIN* (1198)	02	03	00	00	04	-01	03	-05	00	-14	-09	06	04
HAVE SM (1216)	16	32	30	25	28	20	24	10	29	16	18	32	-08
SM HELP* (1192)	16	26	29	20	24	26	19	22	27	37	32	16	-09
IST (1213)	24	13	18	10	20	17	15	18	18	20	21	12	-07
NOT IST* (1193)	04	02	00	05	09	04	-01	06	02	03	06	-05	-07
SQT NOTICE HELP* (1203)	33	19	28	14	20	19	22	27	29	32	32	17	-06
NOTICE HELP USEFUL* (483)	26	12	20	15	24	23	11	26	30	18	16	17	-11
PREPARE* (915)	17	11	17	04	09	11	18	11	22	12	14	10	-04
EQUIPMENT* (323)	05	02	04	04	04	10	-02	03	07	00	04	03	-07
DOCUMENTS* (562)	07	05	06	08	00	08	-02	06	04	10	08	04	-03
TAKEN S.T.* (1223)	41	30	41	18	23	21	28	32	37	26	23	37	-03
SQT - IST* (772)	19	14	13	03	12	19	11	19	19	24	19	00	-10
VERIFY (422)	23	14	19	17	12	25	14	16	19	20	18	12	-12

1. Entries are Pearson Product-Moment correlations, rounded to the nearest hundredth; decimals omit

2. This variable is not included in the usage index.

* Stirred variables have been inverted to clarify the direction of relationships.

is determined to a large extent by certain pragmatics of Army life -- for example, when a soldier is faced with an SQT, he has very little choice but to use his SM. When he must perform a particular task the SM might be his only source of information. These usages would be independent of how the soldier felt about his job or the Army.

A third "cluster" of variables cuts across existing categories; this cluster might be called "Army support." Whether the soldier has received help with how to use his SM, whether he has received help with the SQT Notice, and whether he has received IJT fall into this cluster. These variables as a group have the highest correlations with SM use of any of the background variables. This leads to a perhaps trite conclusion that the best way to increase SM use is to foster its use at the individual soldier level. This would involve encouraging trainers and superior officers to become more involved with individual soldiers and their training, encouraging active use of the SM, and providing scheduled assistance to soldiers on how to make use of Army documents. Similarly, the high correlations of SM use and whether or not the soldier has an SM suggests that the Army should ensure that the logistics of supplying SMs to soldiers are adequate.

The final "cluster" is the set of SQT variables: whether an SQT has been taken, whether resources were adequate for preparation, whether IJT for SQT tasks had been received, and a rough index of SQT performance. As one could have surmised from previous sections of this report, whether or not an SQT was taken correlates highly with all aspects of SM usage. In line with previous findings, SM usage increases with increased IJT on SQT tasks. In particular, this variable is associated with increased supervisor and scheduled support for use of the SM for SQT preparation. However, SM usage was not related to whether the soldier had adequate resources for preparation in terms of equipment or documents, and only a slight relationship with whether he had sufficient time to prepare. Thus, there is no indication that soldiers might have used the SM more frequently when other resources were unavailable.

Finally, there is a positive relationship between SM use and SQT performance. This relationship is explored in greater depth in Chapter V of this report.

In general, the strength of the univariate relationships reflected in Table IV.7 is low. Only 6% represent cases in which 10% or more of the variance in usage is accounted for by a single covariate. Thus, in order to make some more reasonable interpretations of variance in usage, some multiple regression analyses were conducted. These are presented and discussed in the next section.

Regression Analyses

As the final step in the analysis of SM usage, a series of regression analyses were conducted. These analyses were performed to identify those sets of background variables which covary with the Usage Index. In these analyses, two basic "groups" of variables were used -- the background variables and what will be called the "classification" variables. This latter set consists of four variables which essentially describe certain static features of a soldier: MOS, Rank, site, and Study Group. (It will be recalled [see Chapter III] that the Study Group assigns each soldier to one of ten groups, depending upon whether or not he has taken an SQT, is scheduled to take an SQT, and whether he has studied for an SQT. For present purposes, this variable can be viewed as a linear combination of four variables not included in the background set [took SQT, SQT scheduled, SQT study, and SQT Notice received.]) The analytical strategy was to "fit" various combinations of these variable sets in a regression model, using the Usage Index as the dependent measure.

The first model that was tested was the "full" model, using all of the variables (i.e., background and classification). This model contained 52 classification variables (25 for MOSs, 10 for Study Groups, 6 for Ranks, and 11 for site) and 17 background variables. The latter included those variables (of the 24 in Table IV.6) which had 1,100 or more valid responses.

Results indicated that the R^2 (proportion of variance accounted for) of the full model is 0.608. That is, approximately 61% of the variance in the Usage Index was explainable from the entire variable set. Given this figure as a baseline, successive models, with smaller numbers of variables, were tested to isolate the primary covariates.

Table IV.8 summarizes the descriptions and results of applying these various models. The second model tested excluded all background variables and is, in a sense, the "test" of the various speculations and observations made in previous sections of this report concerning differing patterns of usage for different MOSs, Ranks, Study Groups, and sites. These classification variables account for a substantial component of the Usage Index variance (i.e., approximately 55%). Stating this result in another way, there are substantial differences in SM usage for different MOS, Ranks, Study Groups, and sites. These differences are the ones that have been illustrated in the various tables in this chapter.

The next series of models was an attempt to further isolate sources of variance in the classification set. Model 3 tested this set, excluding the site variable. As can be seen, this exclusion lowered the R^2 from .546 to .538; thus, it can be concluded that site is not a particularly potent covariate of usage. Model 4 examined the remaining three variables (Study Group, Rank, and MOS) in combinations of two, and Model 5

Table IV.8

Summary of Regression Models

	<u>df</u>	<u>SS</u>	<u>R²</u>
1. Full model (all variables)	68	6027.2	.608
2. All variables excluding background	51	5410.1	.546
3. Study Group, Rank, MOS	40	5332.0	.538
4a. Study Group and Rank	15	4606.9	.465
b. Study Group and MOS	34	5066.2	.511
c. Rank and MOS	31	3371.3	.340
5a. Rank	6	1415.0	.143
b. MOS	25	2535.4	.256
c. Study Group	9	4350.1	.439
6. Background variables (Stepwise regression; final step)	7	3197.2	.323
7. Study Group, Rank, MOS, and significant background variables	47	5888.7	.594
8. All variables excluding non- significant background variables	58	5944.5	.600
ERROR (full model)	994	3884.7	

examined these variables singly. Results indicate that Study Group, both singly and in combination, is a primary source in accounting for SM usage. Based on previously discussed findings, this could have been expected; whether or not a soldier has taken (or is scheduled to take) an SQT is a principal determinant of SM use. What is perhaps equally interesting is that, even excluding Study Group, Rank and MOS contribute substantially in accounting for SM usage.

Model 6 was of a slightly different sort than the previous models in that a stepwise regression procedure was used in analyzing the background variable set. This procedure extracts individual variables sequentially, iteratively generating correlations between the remaining variables and the Usage Index. The procedure terminates when no remaining variable accounts for a significant (arbitrarily defined as 5% of the remaining variance) proportion of the Usage Index variance. The results of such an analysis are an ordered list of variables and the variance each one is individually accounting for.

The results of this procedure include the following seven background variables, their order of extraction, and their residual correlations with the Usage Index:

<u>Variable</u>	<u>Correlation *</u>
1. SM help (did soldier receive help on the use of the SM)	.362
2. Have an SM	.347
3. SQT Notice help	.324
4. Time in the Army	.212
5. IJT (did soldier receive IJT in his MOS)	.234
6. Reenlist	.173
7. Education	.136

Collectively, these seven variables accounted for approximately 32% of the Usage Index variance (Table IV.8). These results are, for the most part, consistent with interpretations made when the zero-order correlations were presented (Table IV.7 above); that is, of the seven significant variables, three (SM help, SQT Notice help, and IJT) are from

*As a convenience to the reader, the signs of the correlations have been changed where appropriate to reflect the true direction of the relationship. Thus, all of the above correlations are, in fact, "positive": "higher" or "better" scores for each of the variables are associated with higher Usage Index scores.

what we called the "Army support" cluster. To restate what was said above, it seems that supervisory and Unit-level policies and procedures for dealing with soldiers at an individualized level are important determinants of SM use.

Interestingly, two variables which had not previously "appeared" in the discussions of SM use were extracted using the stepwise procedure. These are the soldiers' reenlistment plans (from the "Attitude" cluster) and educational level.

The final two regression models (7 and 8) were essentially refinements of the full model. Model 7 used all variables except use and the nonsignificant background variables (i.e., including only the seven extracted by the stepwise procedures), while Model 8 excluded only this latter set. As can be seen, both Models 7 and 8 are essentially equivalent to the full model.

Before discussing the overall summary and conclusions that can be drawn from these analyses, a further elaboration on the reenlistment variable is appropriate.

As noted in Chapter II, it was intended that one of the criteria for inclusion in the study should be those soldiers for whom the SM was most likely to be a meaningful document -- namely, those who were career-motivated. Thus, in the initial requirements sent by TRADOC to the participating sites, there was a request that the sample should include only those soldiers who planned to reenlist.

However, it was not possible to obtain such a sample, as shown by the fact that only 32.3% of the actual respondents in the study answered affirmatively (and another 28.5% responded, "I don't know right now" when asked in the questionnaire if they were going to reenlist).

With hindsight, it appears that this deviation from the original sampling plan was fortuitous from several perspectives. First, from a conceptual view, the inclusion of soldiers not planning to reenlist makes the survey sample more representative of the Army as a whole. The more important finding, however, is that the "reenlistment" variable does not have a substantial relationship with SM usage. As shown in Table IV.7, the correlation between "Reenlistment" and "Used SM" (the variable indicating whether the soldier used the SM for any purpose, even at least once) was $r = .09$; the remainder of the correlations with other usage variables are also quite low. Also, an examination of the crosstabulations between Reenlistment and MOS, School, Rank, and Study Group (not shown here) reveals no particular patterns of over or underrepresentation of nonreenlistees in any of these subgroups.

As reported above, in the regression analyses conducted to determine covariables of the SM Usage Index, the entire aggregate of background variables added very little to the R^2 over the

combined effect of MOS, Rank, and Study Group.* However, when a stepwise regression of the background variables was conducted, Reenlistment was extracted as accounting for a significant proportion of variance (i.e., approximately 3%). While this is statistically significant, it is of no practical value in understanding SM Usage, and certainly does not support the contention that reenlistment is a potent variable in SM usage. Therefore, it was not considered necessary to partition the survey population according to this variable.

SUMMARY AND CONCLUSIONS

This chapter has described several aspects of SM usage: who uses the SM, how it is used, and what the correlates of usage are. The overall picture one gets from these data is that the primary determinants of SM use or nonuse is the SQT. Furthermore, use of the SM seems to be associated with mostly "extra-individual" factors. Certainly, the status of particular MOSs with respect to SQT scheduling is beyond the individual soldier's control, as are other factors such as support (at the Unit level) for SM use, making sure SMs are available, and the degree of IJT affect use or nonuse of the SM as well.

It is difficult to separate "other uses" from use of the SM for the SQT. Our impression is that once the SM is used for the particular purpose of preparing for an SQT, soldiers tend to also use it for other reasons. Variations in usage patterns among different MOSs make any generalizations problematic; again, it seems as if extra-individual factors are important components of usage patterns.

This latter point requires a little elaboration. It is somewhat surprising that there seems to be little "freedom of choice" for individual soldiers with respect to SM use. It is as if certain soldiers have been told to use the SM; whether they like the book or not, they use it (for example, the SMs with the most "problems" [see Chapter III], namely the 11B and 11C manuals, have among the highest usage scores). Perhaps such personal factors as attitude and education enter into SM use only for non-SQT material; this would explain why this specific usage variable does not relate to the other.

In terms of what the Army can do to increase SM usage, these results indicate two potential areas of application. First, the Army should do whatever is necessary to introduce SMs into the EPMS as early as possible. SMs should be made available to soldiers early in their careers, instructions should be given as to SM use, and SM-SQT integration made obvious to soldiers.

*In fact, by examining Table IV.8, it can be seen that the significant background variables had a unique contribution of 5.6%, computed by subtracting the R^2 for Model 7 from the R^2 for Model 3, to the Study Group, Rank, and MOS variables.

Second, SM use should be encouraged at the Unit and individual soldier level. Soldiers should be encouraged to use the SM not only to prepare for the SQT, but on the job as well.

V. SM USAGE AND EFFECTIVENESS

The final set of analyses to be reported upon examined the relationship between SM usage and individual performance and job proficiency. Two types of criteria were employed to assess proficiency: SQT scores and self-reported estimates of proficiency. In reporting these results, we would urge the reader to view them with caution. The SQTs are themselves continuing to be evaluated; thus, the criterion measures should be considered as "soft." The relationship uncovered between SM usage and effectiveness should, therefore, be treated as suggestive rather than conclusive.

EVIDENCE FOR AN SM USAGE -- SQT SCORE RELATIONSHIP

SQT performance data were obtained from Fort Eustis for a subsample of 740 soldiers.* As shown in Table V.1, MOSs differed sharply in the amount of retrievable SQT information. We were unable to tell whether this was because our sample was unrepresentative of the Army or because these SQTs have not been fielded for a long enough time. In most cases, four separate scores were reported. The first, an SQT Raw Score, is the number of "scorable units" passed divided by the number of "scorable units" attempted. The second score is the Hands-On index, which is the proportion of items scored GO on the physical performance test. The third score is the Written component, which is again the proportion of items scored GO on a written set of items. The fourth score is the Performance Certification Component (PCC), which usually consists of at least a marksmanship and a physical fitness test, and is not unique to all SQTs. These performance estimates are not independent.** Also, the computation rule for generation of the Raw Score is a function of individual MOS. For example, some SQTs weight Hands-On component items more heavily than others. Because of the ambiguity and complexity of the PCC measure and of the Raw Score, the very high correlation between the Written component and Raw Score, we used only two measures -- the Hands-On score and the Written score -- in the following analyses.

*For soldiers who had taken two or more SQTs, a single test was selected for inclusion in the analysis. This selection was based on which SQT the individual soldier had based his or her response in the survey.

**The intercorrelations among the SQT components are as follows: r (SQT Raw and SQT Written) = +.94 ($N = 740$); r (SQT Raw and Hands-On) = +.51 ($N = 467$); and r (SQT Written and SQT Hands-On) = +.30 ($N = 467$).

Table V.1 Numbers of Soldiers with Performance Measures

<u>MOS</u>	<u>Sample Size</u>	<u>SQT Written</u>	<u>H-O</u>	<u>PCC</u>	<u>Confidence Ratings</u>
11B	78	67	64	63	76
11C	83	65	64	59	79
19/11D	40	0	0	0	34
19/11E	30	0	0	0	29
13B	91	83	62	73	89
13E	64	56	55	51	64
16P	66	61	60	49	64
16R	95	83	79	77	93
45K	31	18	15	17	30
45L	13	8	0	7	13
63B	51	22	11	20	50
63C	38	10	10	9	37
63H	51	8	6	7	46
57H	32	2	0	0	32
64C	52	22	0	0	48
71P	42	8	0	7	42
93H	42	32	0	26	42
93J	47	40	0	36	47
74D	26	12	0	12	26
74F	6	5	0	5	
76J	29	7	0	0	29
76P	44	17	0	0	44
76Y	61	27	0	0	41
95B	61	44	30	27	53
95C	47	42	11	4	44
NO MOS	<u>4</u>	<u> </u>	<u>0</u>	<u>0</u>	<u> </u>
	1224	739	467	549	1160

The distributions of the SQT scores were examined by MOS. These data are shown in Table V.2 for the different test components.* For the interested reader, summary scores for Schools have been included, as have individual Skill Level scores.** (It should be noted that these Skill Level Scores, and hence all larger aggregations, combine scores from different tracks and different versions of each particular test.) There are many fascinating aspects of these results; however, in the interest of continuity of presentation, discussion will be limited to those features germane to the present topic.

The first relevant aspect of these data is that there are substantial differences in mean test scores among the MOSs, with a large difference discernible between Combat and Noncombat MOSs. It is beyond the scope of the present project to attempt to determine the causes of these differences, except to the extent that the SMs and SM usage impact upon these scores.*** The important point is that these differences exist. To reiterate the argument presented at the beginning of this chapter, the observation that the tests differ from each other always allows for the interpretation that the scales are not comparable; hence, a higher (or lower) score could always be interpreted as an attribute of the test itself and not due to any correlative variable. The theoretically "best" situation would be a large sample of scores for the same test (i.e., within MOS, Skill Level, track, and version); however, as Table V.2 clearly shows, the samples in the present study are inadequate for this level analysis.

Given that SQT scores differ among MOSs, it is still possible to estimate the extent to which these differences are related to Usage Index variations. In order to make this assessment, a series of multiple regression analyses was conducted. These analyses attempted to account for the variance in the SQT scores, using different sets of variables as "predictors." These analyses are similar to those reported in

*Not shown in Table V.1 are the data from the PCC component. For the tests which included this component, the mean percentage correct across all soldiers was 98%, with no subsample scoring less than 91%.

**More detailed statistics (minimum, maximum, etc.) have been intentionally omitted; these data are presented in the Technical Appendix submitted under separate cover. A comparison of the mean scores and standard deviations reported in Table V.2 and Army-wide data obtained from ATSC show general agreement: the correlation between our sample scores and Army-wide scores was $r = .95$ for the Written component and $r = .74$ for the Hands-On component.

***It is easy to speculate as to potential non-SM-related influences on SQT performance differences among MOSs (e.g., differences among MOSs in emphasis on the Written Component, differences in task selection criteria, differences in performance standards and conditions, etc.).

Table V.2 SQT SCORES

		% Correct ¹		N
School & MOS ²		Written	Hands-On ³	
Infantry		62 (17)	91 (13)	129
	11B	68 (15)	91 (12)	65
	2	68 (14)	91 (14)	31
	3	70 (15)	89 (11)	17
	4	67 (16)	93 (10)	17
	11C	57 (18)	91 (13)	64
	2	57 (19)	89 (16)	38
	3	57 (16)	95 (07)	20
	4	56 (22)	91 (08)	6
Artillery		47 (22)	74 (29)	128
	13B	60 (15)	79 (23)	73
	2	57 (14)	75 (26)	37
	3	69 (12)	86 (16)	25
	4	53 (14)	--	17
	13E	29 (19)	68 (34)	55
	2	21 (13)	72 (29)	29
	3	40 (20)	69 (32)	15
	4	39 (19)	57 (47)	11
Air Defense		66 (17)	85 (17)	139
	16P	70 (17)	86 (16)	60
	2	63 (18)	86 (15)	27
	3	72 (12)	84 (17)	18
	4	79 (15)	89 (17)	15
	16R	63 (16)	84 (18)	9
	2	55 (17)	92 (16)	30
	3	69 (15)	87 (15)	24
	4	66 (12)	82 (23)	25
Ordnance		32 (15)	93 (13)	61
	45K2	28 (12)	96 (12)	17
	45L2	20 (09)	--	7
	63B	43 (15)	92 (16)	21
	2	40 (15)	92 (16)	12
	3	45 (16)	--	9
	63C2	28 (14)	90 (14)	10
	63H2	20 (15)	94 (09)	6
Transportation		47 (17)	--	24
	64C	48 (17)	--	22
	2	43 (19)	--	12
	3	57 (14)	--	6
Aviation		53 (20)	--	80
	71P2	38 (19)	--	7
	93H	60 (18)	--	32
	2	55 (17)	--	13
	3	66 (18)	--	8
	4	67 (16)	--	6
	93J	50 (21)	--	40
	2	43 (22)	--	19
	3	53 (16)	--	16

¹Entries are percentage correct, rounded to the nearest percent. Numbers in parentheses are standard deviations.

²This column is a list of tests, not of MOS soldiers who took them. Typically, a soldier will take an SQT at the last level which is one higher than his present Skill Level.

³Blank entries mean that these tests do not have Hands-On components.

Table V.2 (cont.) SQT SCORES

<u>School & MOS</u>	<u>% Correct</u>		<u>N</u>
	<u>Written</u>	<u>Hands-On</u>	
Adminicen	47(16)	--	17
74D	44(11)	--	12
Health Sciences 76J	35(19)	--	7
Quartermaster	49(18)	--	44
76P	56(10)	--	17
2	54(05)	--	6
76Y	44(20)	--	29
2	36(14)	--	11
4	51(24)	--	13
Military Police	68(16)	76(22)	80
95B	60(15)	72(25)	38
2	62(17)	71(27)	22
3	64(14)	88(13)	8
4	54(13)	--	8
95C	76(14)	79(12)	42
2	75(14)	76(12)	15
3	77(14)	83(12)	22
OVERALL	55(21)	84(21)	740(467)

<u>Rank</u>	<u>SQT Written</u>			<u>SQT Hands-On</u>		
	<u>N</u>	<u>\bar{X}</u>	<u>S.D.</u>	<u>N</u>	<u>\bar{X}</u>	<u>S.D.</u>
E2	6	43	10	--	--	--
E3	60	40	22	37	80	21
E4	242	50	21	178	83	22
E5	236	61	19	154	85	19
E6	188	60	20	93	84	25

Chapter IV, where the Usage Index was the "criterion" variable. The variable sets used as predictors in the different regressions were:

- MOS;
- Rank;
- Study Group;
- Usage Index; and
- Background variables (same as those used in Chapter IV analyses).

SQT Raw score, SQT Written component score, and SQT Hands-On component score were used as dependent criterion variables. For the convenience of the reader, details of these analyses are included in Appendix B.

The results were straightforward. With SQT Raw Scores as the dependent variable, the "full model" (i.e., all the predictor sets) accounted for 58% of the variance. This was almost entirely due to MOS, which alone accounted for 45%. The Usage Index by itself accounted for 10%. The other variable sets contributed little to the prediction. With SQT Written Score as the dependent variable, results were virtually identical: the full model accounted for 56% of the variance, with MOS alone accounting for 43% and the other variable sets adding very little. With SQT Hands-On Score as the dependent variable, the full model accounted for 40% of the variance; MOS accounted for 15% with no other variable set adding anything substantial.

These analyses clearly documented the general impression that SQT score differed as a function of MOS. However, the regression analyses do not specify the direction of the association between MOS and performance since MOS is a categorized variable.

To clarify the nature of this relationship, and to get a clearer picture of the MOS-Usage Index-SQT interactions, a series of scatterplots was constructed. Figure V.1, for example, is the scatterplot of SQT Written Score/Usage Index values for soldiers within each MOS. The solid points represent those MOSs for which there are more than 20 soldiers having both Usage Index and SQT scores; the remaining (X) points represent those MOSs in which fewer than 20 soldiers have Usage and SQT score data.

Figure V.1 shows quite clearly that there is a strong and positive relationship between the Usage Index and the SQT Written Score. In fact, if each MOS is considered as a single data point, the correlation between usage and effectiveness is $r = +.657$ ($N = 21$). Figure V.1 adds substantial weight to the

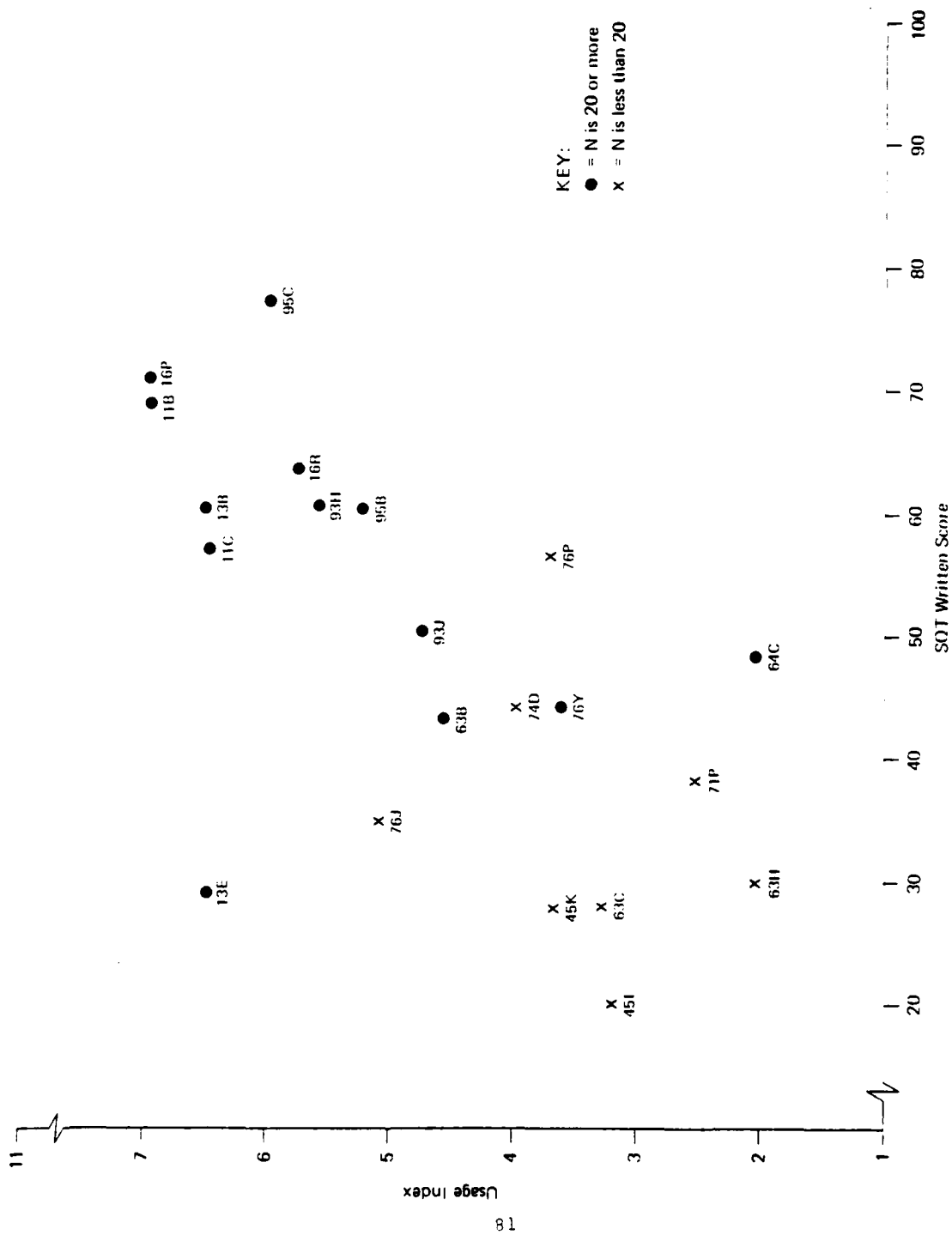


FIGURE V.1 Usage Index and SOT Written Scatterplot

claim of a positive usage-effectiveness relationship, primarily because practically all of the MOSs follow the pattern. (The "outliers" are interesting in their own right, and will be discussed later in this chapter.)

Although this finding is encouraging, some cautions are still indicated; the only "legitimate" conclusion that can be drawn can be stated as follows: considered collectively, certain MOSs are associated with high Usage Index scores and high SQT Written scores, while other MOS are associated with relatively lower values on both dimensions. Alternatively, one can say that the higher a given MOS's Usage Index score, the higher that MOS's SQT Written score is likely to be.

Additional evidence of a positive relationship between SM Usage and SQT performance is presented in Figure V.2, which is a scatterplot of the Usage Index and SQT Hands-On scores. The correlation (again, treating each MOS as a single data point) between the Usage Index and SQT Hands-On score is $r = +.389$ ($N = 11$). (This correlation appears to be smaller due to the substantially narrower range of Hands-On scores compared to Written scores.) The scatterplot presented above says nothing about what is occurring within any particular MOS. That is, at the group level, 11Bs (e.g.) use the SM more and get higher SQT Written scores than other MOSs; that is not to say that, for 11B soldiers, using the SM more would result in higher scores. For example, a plausible alternative explanation could be that: (1) SM use for 11B is routinely scheduled so that everyone has a high Usage Index score; and (2) the 11B SQTs are easier than other SQTs in the sample. Likewise, the single 11B point is actually composed of seven different tests; at this finer level, there is no a priori reason that usage and effectiveness should be positively related (i.e., the same between MOS result could occur if the within-MOS relationship was negative).

The next logical question, therefore, is whether this positive relationship holds up at the next level of analysis: namely, within each MOS. That is, what is the correlation between the Usage Index and SQT scores for (e.g.) 11Bs. The argument for a positive relationship would be strengthened if such relationships also were found at this finer level (if for no other reason than that the SQTs are somehow more "homogeneous" within an MOS). These within-MOS correlations are shown in Table V.3, for those MOSs with more than 20 soldiers.

Again, the results are encouraging. Despite smaller N s, these within-MOS correlations are generally positive, with some MOSs showing suprisingly high correlations. Again, these correlations allow the statement that within certain MOSs, increased SM use is associated with increased SQT scores. Notice that this does not say anything about either absolute SQT scores or even about relative (to other SQT) scores.

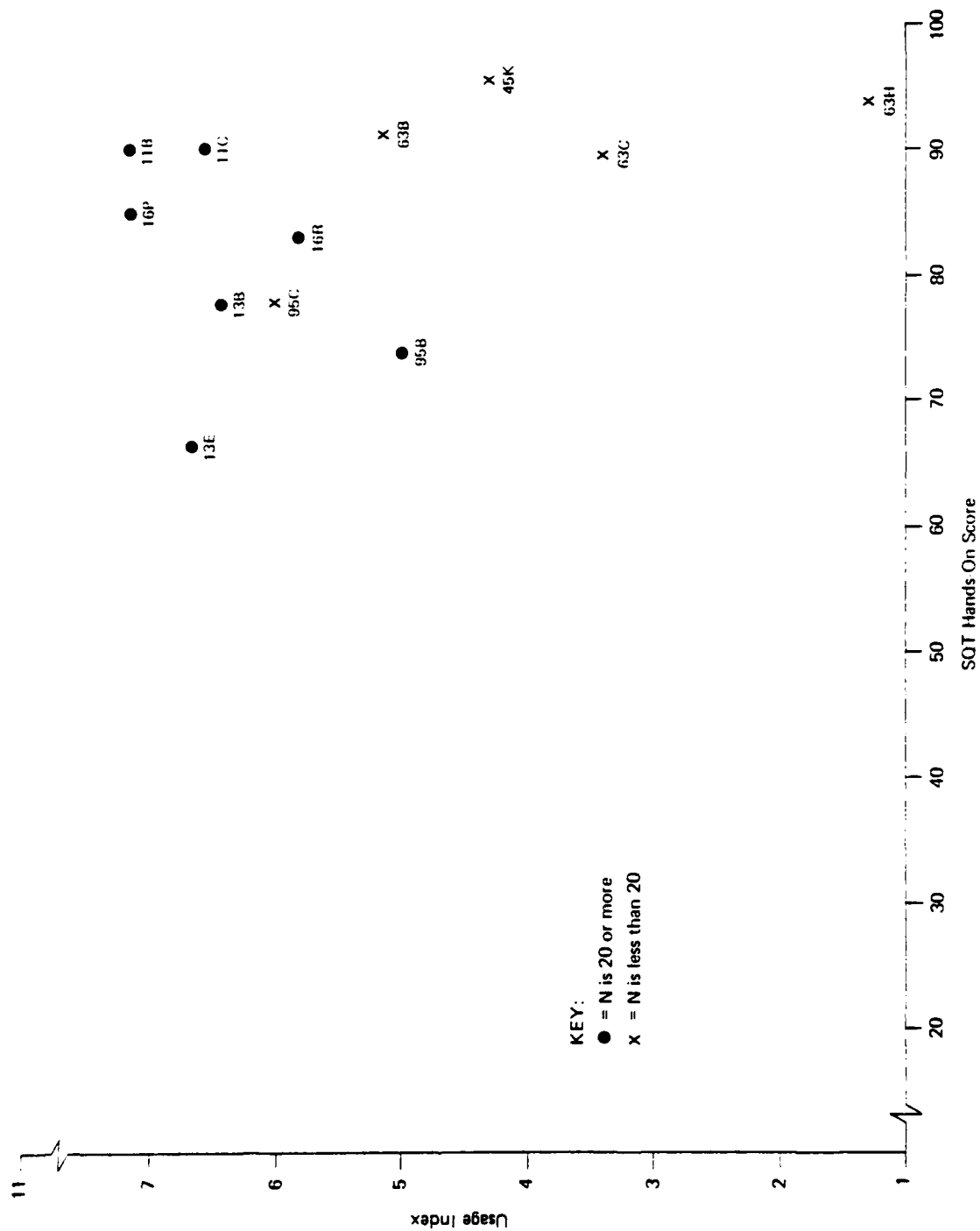


FIGURE V.2 Usage Index and SOT Hands-On Scatterplot

Table V.3 Usage Index Correlations with SQT Scores¹

<u>School & MOS</u>	<u>SQT Raw</u>	<u>SQT Written</u>	<u>SQT Hands-On</u>
Infantry			
11B	25 (67)	13 (67)	39 (64)
11C	17 (65)	07 (65)	28 (64)
Artillery			
13B	10 (83)	11 (83)	15 (62)
13E	13 (56)	-02 (56)	35 (55)
Air Defense			
16P	22 (61)	28 (61)	17 (60)
16R	26 (83)	34 (83)	10 (79)
Ordnance			
63B	17 (22)	12 (22)	
Transportation			
64C	21 (22)	21 (22)	
Aviation			
93H	46 (32)	46 (32)	
93J	20 (40)	19 (40)	
Quartermaster			
76Y	49 (27)	49 (27)	
Military Police			
95B	36 (44)	37 (44)	
95C	10 (42)	07 (42)	

¹Entries are Pearson Product-Moment correlations, rounded to the nearest hundredth; decimals omitted. Numbers in parentheses refer to the number of soldiers comprising the correlation.

THE USAGE INDEX AND CONFIDENCE RATINGS

As mentioned previously, an alternative or surrogate performance measure was obtained from practically all of the soldiers included in the survey -- namely, the individual's self-reported confidence in his ability to perform tasks required in his MOS. Each soldier was given a list of tasks pertaining to his MOS and Skill Level (and, when appropriate, his track). He was asked to respond to three questions for each task:

1. Have you ever been trained for this task? (Yes or No)
2. Do you perform this task on the job? (Yes or No)
3. How confident are you in your ability to perform this task?

The last question was in a 5-choice, forced-response format, with the alternatives labeled as:

- A. Can't do it
- B. Can do it, but not very well
- C. Can do it fairly well
- D. Can do it well
- E. Can do it very well

As part of the instructions read to soldiers, an "anchor" was given by saying that, "If you can perform this task well enough to pass an SQT, rate your confidence as a D. If you can perform it better than required by the SQT, rate it an E."

Information presented to soldiers regarding each task consisted only of the task name taken directly out of the SQT Notice (these task names are virtually identical to those found in the SM).^{*} The number of tasks that a given soldier rated was limited by the number of tasks in the SQT Notice; an arbitrary upper limit of 48 tasks was set to prevent fatigue. It should be noted that no distinction was made in the instructions between tasks taken from the Written Component or the Hands-On Component of the SQT. That is, soldiers responded to a performance question -- can you do the task? They were not asked to rate their confidence in their ability to pass a written item on an SQT; undoubtedly, such an instruction would have affected their ratings.

^{*}Despite the occasional "jargon" in some task names, soldiers apparently had no problems in understanding what the tasks were from just the titles.

Given this alternative effectiveness measure, descriptive statistics were generated for the three "confidence" dimensions as shown in Table V.4. An examination of the means and standard deviations in Table V.4 seems to indicate a satisfactory range of ratings (i.e., there was variability both within and between MOSs on all three dimensions).

Next, various correlations were computed. The first set of correlations was among the three confidence dimensions themselves. This was to determine the internal consistency. The correlations among the three dimensions were quite high:

$$r \text{ (Trained and performed)} = +.819 \text{ (N = 1144)}$$

$$r \text{ (Trained and Ratings)} = +.858 \text{ (N = 1155)}$$

$$r \text{ (Performed and Ratings)} = +.955 \text{ (N = 1144)}$$

Thus, soldiers appeared to view ability to perform a task as a function of training and performance experiences.

Another set of correlations was computed between the two SQT measures (SQT Written, and SQT Hands-On) and the "appropriate" Confidence Ratings -- that is, SQT Written items were correlated with the Confidence Ratings for the same subset of tasks. Similarly, SQT Hands-On items were correlated with Confidence Ratings for the same tasks.* These correlations are:

$$r \text{ (SQT Written with CR Written)} = +.37 \text{ (N = 714)}$$

$$r \text{ (SQT Hands-On with CR Hands-On)} = +.36 \text{ (N = 447)}$$

The same series of correlational analyses were conducted for the Confidence Ratings as were done for the SQT data. That is, a multiple regression coefficient was computed (with Confidence Ratings as the dependent variable), the scatterplot of Usage Index and Confidence Rating scores was generated, and within-MOS correlations between the Usage Index and Confidence Ratings were computed.

In general, these results "track" the SQT data very well. The multiple regression, using the "full" model (MOS, Rank, Study Group, Usage Index, and Background variables) was able to account for 40% of the variance in Confidence Rating scores. Again, MOS alone accounted for most of this (i.e., 29%), while SM Usage accounted for roughly 10% in this analysis. Details of this analysis are presented in Appendix B.

*Correlations among the SQT scores and the other two Confidence dimensions (Trained and Performed) were also calculated; the correlations were all positive but lower in magnitude than those reported here.

Table V.4 Confidence Rating Descriptive Statistics

School & MOS	Prop. Tasks Trained	Prop. Tasks Perf.	Task Ratings				
			\bar{X}	S.D.	Max.	Min.	N
Infantry							
11B	92	87	4.20	0.65	5.00	1.54	76
11C	90	79	3.91	0.63	5.00	1.19	79
Armor							
19D	92	81	4.11	0.73	4.91	1.38	34
19E	85	77	3.77	0.61	4.75	2.35	29
Artillery							
13B	88	83	4.12	0.73	5.00	1.65	89
13E	83	63	3.60	0.82	4.87	1.72	64
Air Defence							
16P	83	73	3.98	0.65	5.00	2.12	64
16R	83	76	3.76	0.75	5.00	1.92	93
Ordnance							
45K	64	47	2.94	0.85	4.36	1.00	30
45L	85	50	3.15	0.80	4.83	2.22	13
63B	67	73	3.65	0.73	4.94	1.11	50
63C	74	60	3.68	0.76	5.00	2.00	37
63H	58	43	2.95	0.71	4.64	1.42	46
Transportation							
57H	53	22	2.21	0.93	5.00	1.00	32
64C	81	70	3.97	0.61	5.00	2.43	48
Aviation							
71P	77	52	3.39	0.82	4.62	1.32	42
93H	81	66	3.60	0.74	4.63	1.03	42
93J	86	59	3.75	0.72	5.00	1.47	47
Admincen							
74D	66	54	3.31	0.80	4.51	1.67	26
Health Sciences							
76J	76	44	3.17	0.85	4.93	1.70	29
Quartermaster							
76P	64	38	2.62	0.96	4.86	1.31	44
76Y	66	37	2.94	0.89	4.88	1.04	41
Military Police							
95B	85	64	3.72	0.65	4.93	1.63	53
95C	87	80	4.28	0.74	5.00	1.08	44
OVERALL	80	66	3.64	0.88	5.00	1.00	1160

The scatterplot (Figure V.3) again shows a strong positive relationship between the Usage Index and effectiveness: if each MOS is considered as a single data point, the correlation between the Usage Index and Confidence Rating is $r = +.755$ ($N = 24$).*

Table V.5 shows the within-MOS correlations (in this case, for all MOSs in the survey, since this correlation is not limited only to soldiers who have taken an SQT). Again, similar to Table V.3, these correlations are generally positive. In fact, they appear to be higher for the MOSs which were not included in the previous analyses.

Thus, the Confidence Ratings add additional weight to the arguments in favor of a positive usage-effectiveness relationship. Not only was the same pattern of results obtained (with substantially larger N s in the analysis), but also, the Confidence Ratings are not affected by the class of "test-specific" problems that could have influenced SQT performance. Finally, there is an intuitive argument that a Confidence Rating might be more generalizeable across different tests (and different MOSs) than an SQT score. The soldier could interpret a Confidence Rating as if he was being asked if he could "do his job" (whether his job is easy or difficult). Somehow, the concept of being able to "do one's job" makes more sense across different MOSs than the concept of "achieving 60% or 80% GO scores on a selected sample of tasks in one's MOS."

SUMMARY AND CONCLUSIONS

This chapter has presented several lines of evidence concerning an SM usage-performance effectiveness relationship: multiple regression, between and within MOS correlations, Confidence Rating analyses, and Study Group comparisons. None of these analyses could individually establish an unambiguous usage-effectiveness relationship; the argument is that each can strengthen or weaken one's opinion regarding the relationship.

In this light, the evidence supporting a positive usage-effectiveness relationship is consistent and, with reservations, convincing. All analyses demonstrated results consistent with increased effectiveness and SM usage. The strongest evidence is the correlations at the MOS level (graphically shown in Figures V.1 - V.3) and the within-MOS correlations for many of the MOS (Tables V.2 and V.5). The generalization that MOSs with higher Usage Index scores score higher on their SQTs and have higher confidence in their ability to do their jobs is statistically valid. Obviously, one can hypothesize other factors which could affect both SQT performance and SM usage.

*Similarly, the correlation (with $N = 24$) between the Usage Index and Proportion of Tasks Trained is $r = +.791$, and between the Usage Index and Proportion of Tasks Performed is $r = +.819$.

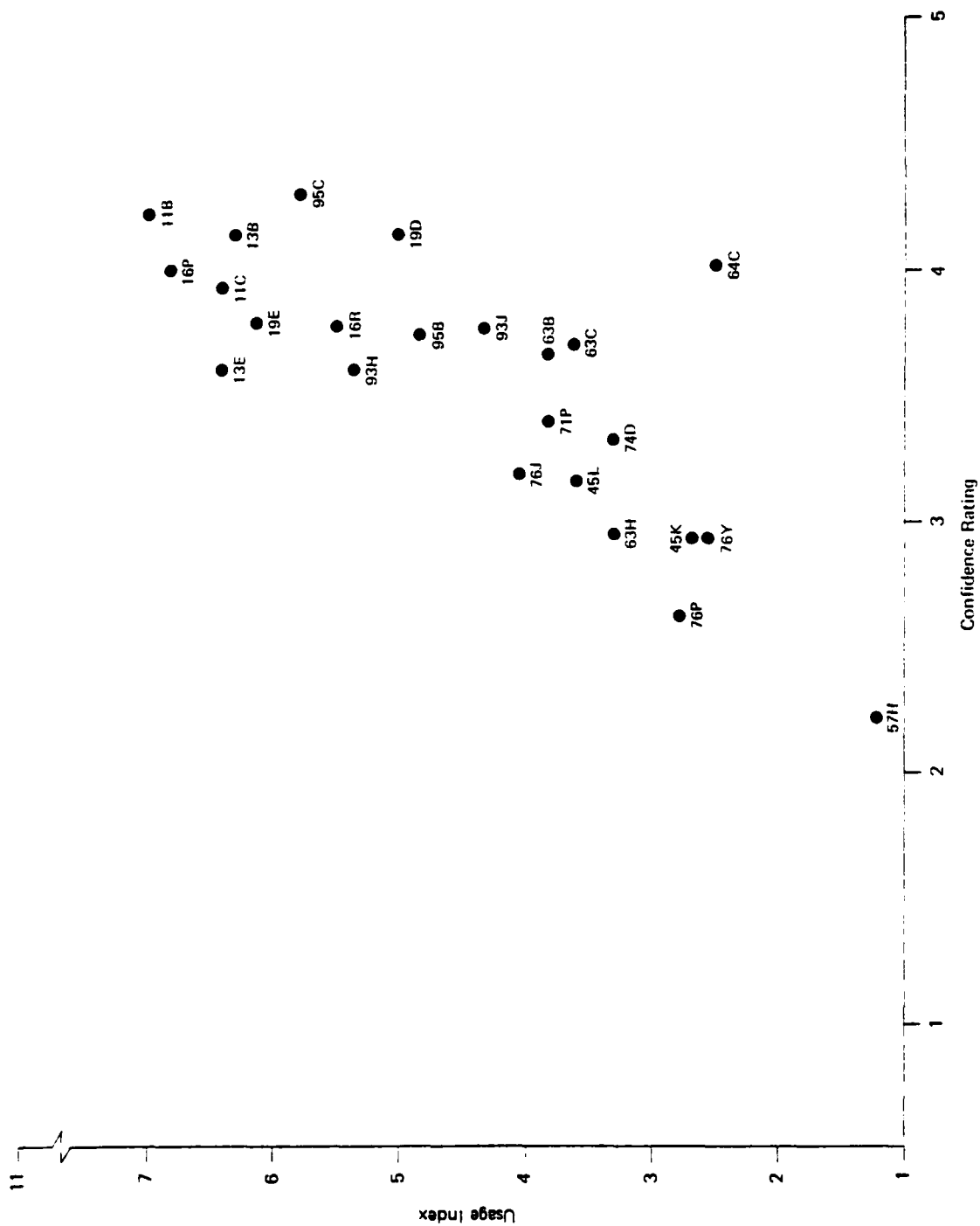


FIGURE V.3 Usage Index and Confidence Rating Scatterplot

Table V.5 Usage Index Correlations with Confidence Ratings¹

<u>School & MOS</u>	<u>Confidence Rating</u>	<u>N</u>
Infantry		
11B	28	75
11C	10	79
Artillery		
13B	21	64
13E	21	64
Air Defense		
16P	31	64
16R	33	93
Armor		
19D	29	34
19E	27	29
Ordnance		
45K	11	30
45L	37	13
63B	15	50
63C	29	37
63H	-30	46
Transportation		
57H	26	32
64C	01	48
Aviation		
71P	50	42
93H	00	42
93J	-02	47
Admincen		
74D	-07	26
Health Sciences		
76J	37	29
Quartermaster		
76P	19	44
76Y	08	41
Military Police		
95B	34	53
95C	11	44

¹Entries are Pearson Product-Moment correlations, rounded to the nearest hundredth; decimals omitted.

One factor could be characteristic of the SMs themselves: SMs with specific deficiencies (as perceived by the soldiers) might not be used appropriately, or if used, might actually contain irrelevant or "wrong" information (again, from the soldier's perspective). To investigate this possibility, the SMs that have been identified as having significant problems (Chapter III) were examined in light of the usage-effectiveness results.

In Chapter III, seven SMs were identified as likely candidates for revision. These were 63H, 76J, 76Y, 95B, 13E, 45K, and 74D. If these MOSs are identified on Figure V.1 of this chapter, it can be seen that six of the seven MOSs (the exception being 95B) had among the lowest SQT Written Scores. (It should be noted that 76H, 45K, 74D, and 63H had fewer than 20 soldiers with SQT scores; however, according to Army-wide data, the results of our sample can be considered representative.) Similarly, if Confidence Ratings for these MOSs are examined (Figure V.3), five of the seven (excluding 95B and 13E) had among the lowest confidence in their ability to perform their jobs. Thus, there seems to be a general correspondence between performance effectiveness and "quality" of SM.

A closer examination was made of these seven MOSs, namely the within-MOS correlations between usage and performance effectiveness (using the Correlations with Confidence Ratings, Table V.5). Suprisingly, the four "poorest" performers (45K, 76Y, 74D, and 63H) had either very low positive correlations or negative correlations. It appears that soldiers in these MOSs were at least internally consistent: there were no relationships between usage and effectiveness for "poor" SMs; soldiers who did use the SM did not consider themselves better able to do their jobs.

At a more detailed level, specific patterns of "problems" (Table III.9) were examined for these "poor" SMs. No particular clusters of problems are apparent for these SMs, but it can be seen that the four poorest performers (45K, 76Y, 74D, and 63H) all reported problems with the test sections of the SM and reported extensive problems in the "SM and the Job" cluster (i.e., the SM does not tell you how to perform the job, the tasks in the SM are not critical to the job, tasks as described in the SM are different from the way they are actually done, and there are errors in the SM). Of course, these problems are not unique to these MOSs, but it is potentially interesting to note these commonalities within this subgroup.

Patterns of usage (Chapter IV) were also examined for these "poor" SMs. It is difficult to summarize the several dimensions examined in Chapter IV, but as a general observation, it seems that these MOSs reported substantially lower non-SQT use than other MOSs (see Table IV.1). Also, these SMs were less frequently used for other reasons. Furthermore, soldiers in these MOSs tended not to use the SM on their own to prepare for the SQT.

Although these observations cannot be considered as either systematic or conclusive, they do suggest that there is an interaction among quality of the SM, SM usage, and performance effectiveness. A more limited conclusion concerning the specific issue of this chapter, namely the SM usage-performance effectiveness relationship, would be that a positive relationship exists. However, this relationship is moderated by several factors: Is the SQT a good representation of the soldiers' jobs? Is the SQT closely tied to the SM? Is there unit-level support or emphasis on SQT preparation and SM use? Is the SM a good or poor representation of the soldiers' jobs? Negative answers to any of these questions would limit the usefulness of the SM for performance effectiveness; positive answers would enhance the positive relationship.

VI. SOLDIER AND SENIOR INTERVIEWS

This chapter will present and discuss data obtained from soldier and senior interviews. These data are more qualitative in nature than the preceding; thus, the presentation will be directed toward the development of a general "picture" of the findings rather than toward statistical rigor. The soldier interview data consists of two parts: (1) the basic questionnaire with the addition of a few questions on knowledge of EPMS and its related elements and (2) the Critical Incident interview. Results related to the first part have been incorporated into the main data base and are discussed as appropriate in other sections of the report. The Critical Incident data, although essentially confirmatory of the questionnaire findings, is a unique data source and will be looked at in some detail in this chapter. This will be followed by a discussion of the senior interview findings.

CRITICAL INCIDENT DATA

Introduction

Critical incident data were requested of respondents participating in one-on-one questionnaire interviews. As a last item of the interview, respondents were asked: "Think back over the past several months and try to remember a specific event or incident that took place that had something to do with the effective or ineffective use of the SM. It may have been good or bad, helpful or not helpful, but we want to know what actually happened. Can you think of something?" If the respondent was unable to recall any specific incident connected with SM usage, the interviewer would probe further with question such as, "Did you use or try to use the SM recently?", perhaps using information from the interview to stimulate response. A response which is a "complete" Critical Incident contains the following information: the persons involved, where and when the event occurred, what happened, and the result.

Critical incident data were obtained from a total of 302 respondents.* Table VI.1 shows a breakdown of respondents by several categories.

*Although there were a total of 353 soldier interviews conducted, the critical incident item was asked of only 302 respondents. Limited time available for the interview was the primary reason that this final item had to be omitted for 51 interviewees. A copy of the interview form for collecting critical incidents can be found in Appendix A.

Table VI.1. Respondents Interviewed for Critical Incidents

	Total (N=302)	% Total
U.S.	203	67.2
Europe	99	32.7
Combat Arms MCS	133	44.0
Combat Support MCS	169	56.0
Skill Level 1	135	44.7
Skill Level 2	91	30.1
Skill Level 3	74	24.5
Skill Level 4	2	1.0

Respondents tended to have difficulty recalling specific incidents which included all the desired information. Interviewers were instructed to write down anything that was said, even if it was a very fragmented and incomplete statement. A total of 220 responses of some kind were recorded on the interview forms. Of these 220, 92 consisted only of flat statements reporting minimal usage or non-usage (e.g., "Never looked at SM except to take SOT," "When actually doing job, will pick up the FM 640 before using SM"). These 92 were not analyzed because they were too fragmentary to provide useful information. (Such comments would have been reflected in answers to questionnaire items, so the information is not lost.) The remaining 128 responses were analyzed further and are described below. Six of these 128 were complete critical incidents -- that is, responses with complete information. The remaining 122 responses are lacking one or more pieces of information, but they do contain useful material on SM usage. These 128 "items" were provided by 124 respondents. Table VI.2 shows a breakdown of the 128 items by type of respondent providing the item.

Table VI.2. Total Items by Respondent Type

	Total (N=128)	% Total by Category	% by total respondents Category
U.S.	89	69.5	43.8 (N=203)
Europe	39	30.5	39.3 (N=99)
Combat Arms MOS	76	59.4	57.1 (N=133)
Combat Support MOS	52	40.6	30.8 (N=169)
Skill Level 10	57	44.5	42.2 (N=135)
Skill Level 20	36	28.1	39.5 (N=91)
Skill Level 30	35	27.3	47.3 (N=74)

The total number of "positive" items -- that is, where the SM is described as at least satisfactory -- was 109; 14 items were negative and 5 unclear. Table VI.2a contains a breakdown of the negative items. Figures in parentheses are the totals, with unclear items counted as negative. Although the total N is small, the negative responses tend to cluster in the U.S. rather than Europe, and to be more likely to occur in combat arms MOSs and at the lower skill level.

Analysis of Critical Incident Items

The 128 Critical Incident Items were classified into four categories: (1) job-related usage -- accounting for 33.5%; (2) usage related to group training -- accounting for 25%; (3) usage by an individual soldier related specifically to advancement -- accounting for 19.5%; and (4) usage related to settling arguments -- accounting for 12.5%. Twelve items (9%) failed to correspond to any one category.

Table VI.2a. Negative Items by Respondent Type

	Total (N=14)	% Total by Category	% by total items in Category
U.S.	10(15)	71.4	11.2 (N=89)
Europe	4(4)	28.6	10.3 (N=39)
Combat Arms MOS	12(16)	85.7	15.8 (N=76)
Combat Support MOS	2(3)	14.2	3.8 (N=52)
Skill Level 10	9(10)	64.3	15.8 (N=57)
Skill Level 20	2(4)	14.3	5.6 (N=36)
Skill Level 30	3(5)	21.4	8.6 (N=35)

In the first category, 43 items reported SM usage relating to the job performance of the individual soldier. Thirty-five items reported usage in which the SM was described as at least satisfactory. A typical positive item in Category I reads: "Around Christmas. Trying to tune jeep free-hand -- but not adjusting point gap so misfired (does not usually work on jeep). Frustrated trying to tune over and over. Finally looked in SM, followed steps, everything worked out well." Eight items report usage in which the SM was perceived by the soldier as unsatisfactory, as in this item: "The instructions in the SM for checking oil level in tank vary considerably from the instructions printed on tank's engine block. This difference became apparent to me about 20 months ago when I had occasion to check the oil in a tank. Most of the other people are still checking it the way described in the SM, but I'm following the directions on the engine block. SM recommends that oil change be determined by time whereas it seems more reasonable to change by mileage." Table VI.3 gives a breakdown of the 43 items in Category I.

Table VI.3. Category I: Job-Related SM Usage

	Total (N=43)	% by Category (N=43)	% by items in Category
U.S.	32	74.4	35.9 (N=89)
Europe	11	25.6	28.2 (N=39)
Combat Arms MOS	23	53.5	30.2 (N=76)
Combat Support MOS	20	46.5	38.4 (N=52)
Skill Level 10	24	55.8	42.1 (N=57)
Skill Level 20	8	18.6	22.2 (N=36)
Skill Level 30	11	25.5	31.2 (N=35)

In the second category, 32 items (25.0% of total 128) report usage of the SM related to group training. In this category, three items report usage where the SM was found unsatisfactory as a training tool. One of these by a 16P30 reads: "In preparing lesson on TADDS placement and operation, referred to manual for planning instructions. Manual wasn't complete enough, so took recommendation to look up additional references. Stayed with TM and away from SM." Two items report on SM usage where the TM conflicted with another source but neither was found clearly superior, as in this report of unresolved conflict: "On a task involving coaxial (M 7.62mm) machine gun. Procedure described in the SM is slightly different from the same procedure described in the SQT manual used in class. I observed this myself during a class held here at Bragg about six months ago. The instructor was also aware of this ambiguity." The remaining 27 items report

positive usage of SM in group training, such as the following by an 11B20: "When transferred it was noticed that many people were weak in communications. Used SM to train people in encoding and decoding and proper radio procedures and how to set up the PRC-77 (FM radio), the TA-312 and TA-1 (field telephones). Used SM for CEOI portion. SM helped other people understand the subject." Another example: "As squad leader, was expected to train squad on various tasks between work and on slack time. The SM made it easy to identify 15-20 minute chunk to go over on breaks."

Table VI.4 shows the breakdown of this group category of items. It is interesting to note that while individual training items tend to cluster at the 10 skill level (Table VI.3), the group items cluster at the 20 and 30 skill level. Also, individual items are fairly evenly distributed between combat arms and combat support MOSs, while the group items are more prevalent in the combat MOSs.

Table VI.4. Category II: Group Training

	Total (N=32)	% by Category (N=32)	% by items in Category
U.S.	23	71.8	25.8 (N=89)
Europe	9	28.1	23.0 (N=39)
Combat Arms MOS	20	62.5	26.3 (N=76)
Combat Support MOS	12	37.5	23.0 (N=52)
Skill Level 10	5	15.6	8.8 (N=57)
Skill Level 20	15	46.8	41.6 (N=36)
Skill Level 30	12	37.5	34.2 (N=35)

In the third category, 25 items (19.5% of total 128) reported SM usage by an individual soldier for purposes of advancement, relating to the SQT, other tests, or the Promotion Board. Three items in this category, all from respondents at skill level 10, reported unsatisfactory usage, as in this item: "Day before SQT -- studying for SQT and couldn't find answers in SM for several questions that I thought would be on SQT (because they were in SQT Notice) -- questions about weather, and one of CST procedures for shock. Asked supervisor -- supervisor told me the answer." More typically, items report usage in which the SM is described as helpful for purposes of advancement: "Used manual to prepare for the Promotion Board. Was asked, 'Name some of the files that are used in medical supply,' 'What type of forms are used for ordering. . .'. Answered these questions correctly because I had read SM."

Table VI.5 summarizes these data. As might be expected, skill level 10s are the most frequent users of the SM for advancement purposes.

Table VI.5. Category III: Advancement

	Total (N=25)	% by Category (N=25)	% by items in Category
U.S.	17	68.0	19.1 (N=89)
Europe	18	32.0	20.5 (N=39)
Combat Arms MOS	12	48.0	15.7 (N=76)
Combat Support MOS	13	52.0	25.0 (N=52)
Skill Level 10	17	68.0	29.8 (N=57)
Skill Level 20	6	24.0	16.6 (N=36)
Skill Level 30	2	8.0	5.7 (N=35)

In the fourth category, 16 items (12.9% of the total 128) reported use of the SM to settle arguments. No items reported incidents in which the SM failed to settle an argument. A typical item reads: "In Germany, working on M-113 (light armored vehicle); had an argument with a co-worker on a certain engine procedure. Went to SM where it listed the steps. Manual was different from what either of us had learned; followed steps in SM. Procedure worked." Items in this category also include incidents in which a soldier argues with superiors: "Mortar Certification Test -- got a No-Go. But I showed them in the SM that it was supposed to be done that way. The test has now been changed to match the SM." Another example of the use of the SM to settle disagreements is also a good example of one of the more complete incidents reported. It also shows the dual nature of some incidents, since it suggests that the purpose of using the SM was related to the SQT. This incident was reported by a 63B10 in Germany: "Looking through Common Task Manual right before SQT; read about M258 skin decontamination kit. Had a class in which this task was discussed. I spoke up and told sergeant what he said was not correct procedure; I had just read correct procedure in Common Soldier Manual." Sergeant told him manual was wrong. Respondent checked with First Sergeant. First Sergeant checked his manual; also incorrect information. The respondent went to Learning Center and took out Common Task Manual and found out that he was right. "Went back and proved my point."

Table VI.6 summarizes the results for this category. The combat soldier seems to be more argumentative than the support soldier, as do skill level 10s from higher skill levels.

Table VI.6. Category IV: Settling Arguments

	Total (N=16)	% by Category (N=16)	% by items in Category
U.S.	10	62.5	11.2 (N=89)
Europe	6	37.5	15.3 (N=39)
Combat Arms MOS	12	75.0	15.7 (N=76)
Combat Support MOS	4	25.0	8.0 (N=52)
Skill Level 10	8	50.0	14.0 (N=57)
Skill Level 20	4	25.0	11.1 (N=36)
Skill Level 30	4	25.0	11.4 (N=35)

The 12 items not fitting into the four categories are either missing too much information ("Lots of information on cleaning weapons, use of gas mask, etc., that's useful -- haven't had training in this at BCT") or report usage which is not described by any of the categories ("December 1978. Was on testing committee-3rd brigade motor platoon. Selected just a few days before to monitor tests -- used SM as a reference"). Of these 12, the SM is described as satisfactory in nine items, three items are unclear, and in no item is the SM described as unsatisfactory.

Summary of Critical Incident Results

The following general statements are supported by the review of the critical incident results:

- Combat Arms respondents tend to report more instances of usage than do Combat Support respondents (Table VI.2).
- Combat Arms respondents tend to report more usage in settling arguments than do Combat Support respondents (Table VI.6).
- Skill Level 10s from Combat Arms MOSs at U.S. Sites tend to report more negative items than do other types of respondents (Table VI.2a).
- 10s tend to report more usage in settling arguments than do other skill levels (Table VI.6).
- 20s and 30s tend to report more usage in group training than do 10s (Table VI.4).

Reading the Critical Incident items also suggests that respondents will use the SM in emergency, unfamiliar, or danger situations (as in this item: "There was a disturbance at the Mannheim prison facility in December. Prisoners rioted and burned mattresses -- some property damage, no personal injury. Many people were inexperienced in riot situations and used SM to find out SOP for handling disturbances -- SM helped handle the situation"), and when they feel the SM contains knowledge that might be useful in civilian life or professional life after their ETS (e.g., "Helped to learn artificial respiration -- it was so well presented that I will remember how to do it when I leave the Army [within the next few months]").

In general, the Critical Incident results are somewhat disappointing in that relatively few complete incidents were obtained. However, the above discussion does lend a sense of reality and concreteness to the more quantitative data obtained, and is generally supportive of many of the findings that come out of those data. One certainly gets the clear sense from these incidents that the SM can be a very effective document to a variety of soldiers in a wide variety of situations relating to their individual job proficiency and advancement.

SENIOR INTERVIEW DATA

Introduction

The point is made in Chapter I that an understanding of the use and effectiveness of the SM requires an appreciation of the training environment in which it is embedded. It is also noted that this environment includes the support or non-support of the senior-level personnel who have individual training responsibilities or who manage those who do. To this end, a senior-level interview protocol was prepared (a copy of which is in Appendix A). At each site visited, it was requested that several persons involved in the administration and/or management of individual training and evaluation, including the administrator of the SQT, be made available for such an interview.

The staff interviewer was instructed to conduct an informal discussion with special attention to the individual training environment in the unit, and to the attitudes and perceptions of the senior-level person toward the SM, SQT Notice, the SQT, and the use of these items by the soldiers for whom they were responsible. The interview protocol was intended as a general guideline to provide some structure to the discussion and to help ensure a basic level of consistency between them. However, areas of discourse were pursued when it seemed appropriate, even though they were not included in the protocol. In some cases, the interview could not be completed due to the length of the discussion and/or the press of other duties.

A further point to be made concerning these materials is that there is no necessary organizational relationship between the senior-level and soldier interviews at the same site. A company commander would be interviewed if he were available, even though the soldiers we obtained in the survey were from a different company. Thus, we cannot interpret the results of the senior group as directly supporting or not supporting results of the survey except in a general way.

In short, the material that follows represents an important part of the total information base that allows one to see in broader perspective the true nature of the SM and some of the critical factors that exert an influence on its use and effectiveness. However, the nature of these data preclude formal analysis and rigorous comparison with the larger data base.

Description of Sample

The sample for the senior interviews consists of both senior enlisted (N=141), warrant officer (N=6), and officer (N=50) personnel. The senior enlisted group included E5s through E9s and the officer group WO1 through O5. The following table summarizes the sample by level and the site at which the interviews took place:

Pay Grade/Rank	Site				Total
	Bragg	Campbell	Stewart	Europe	
E5 - Sergeant	1	-	9	5	15
E6 - Staff Sgt.	2	18	4	21	45
E7 - Sgt. 1st Class	-	27	11	30	68
E8 - 1st Sgt.	5	-	2	5	12
E9 - Sgt. Major	-	-	1	-	1
WO1 - Warrant Officer	2	-	-	-	2
WO2 - Chief Warrant Officer	1	1	2	-	4
O1 - 2nd Lt.	-	2	-	1	3
O2 - 1st Lt.	4	1	3	2	10
O3 - Captain	3	7	7	3	20
O4 - Major	1	4	-	3	8
O5 - Lt. Col.	-	5	2	2	9
TOTAL	19	65	41	72	197

The most common job title for the enlisted group is "Platoon Sgt." or "Leader" (N=32), with the next being "Motor Sgt." (N=14) followed by "Training NCO" (N=13) and "Squad Leader" (N=9). At the officer level, the group includes nine COs, seven Company Commanders, and four Battery Commanders.

Average job experience for the total group is very close to one year, although the range is quite large (from one month to 14 years). As one would expect, the experience factor varies somewhat by rank, with the higher ranks having somewhat more experience than the lower ranks.

No Army-wide representativeness is claimed for this senior-level group. However, it provides a rich source of information that we believe assists greatly in making a more complete and meaningful assessment of the use and effectiveness of the SM.

General Training Attitudes and EPMS

Conceptually, the critical aspects of the training environment in the unit are the attitudes and perceptions of those responsible for training. These attitudes can filter directly down to the individual soldier in many ways: the support given to training in terms of availability of resources, incentives provided to soldiers, and eventually to the motivation and attitude of individual soldiers. Similarly, many factors can influence senior-level attitudes, such as their view of their responsibilities and resources, their perceptions of still higher-level supports, and so on. Interviewers attempted to assess these senior-level attitudes informally, primarily in terms of how these personnel viewed how the "system" worked.

To initiate these conversations (and also to provide further background information on the interviewees and their units), senior-level personnel were asked to characterize the mission of their units. Of the senior enlisted personnel, 34 percent (of 134) characterized their unit as Combat Arms, 54 percent as Combat Support, and 12 percent as both. On the same dimension, 23 percent (of 54) of the officers characterized their units as Combat Arms, 60 percent as Combat Support, and 4 percent as both. They were then asked to characterize the training "climate" in their unit.* It was possible to classify responses in the following groups:

*This concept was familiar to most of the interviewees. If they required further definition, interviewers suggested ideas like amount of time and emphasis placed on training, NCO attitudes toward training, etc.

	% of Senior Enlisted (N=116)	% of Officers (N=54)
Excellent	22%	33%
Good	34%	37%
Fair	21%	17%
Poor	23%	13%

While several interviewees were quite willing to elaborate upon the sources of the problems, conversations were directed toward two particular issues. The first was whether they perceived a match or mismatch between their unit's training requirements and training resources. As expected, this was perceived as a problem in many cases:

	% of Senior Enlisted (N=138)	% of Officers (N=54)
Very well matched	9%	11%
Well matched	27%	35%
Not well matched	46%	46%
Poorly matched	17%	7%

The second potential source of discontent was the perceived impact of the (relatively new) EPMS on their workload. Again, results were generally in accord with expectations:

	% of Senior Enlisted (N=103)	% of Officers (N=46)
An overly excessive burden	15%	13%
A large increase in workload	20%	37%
Some increase	18%	11%
Very little impact	15%	20%
No impact	32%	20%

Nevertheless, most senior-level personnel had positive attitudes toward the EPMS. Of 119 senior enlisted interviewees, only 11 percent said that the system is not worth trying to make work; similarly, only six percent of the officers said the system is not worth giving their support.

Individual Job Training

A major topic of conversation was Individual Job Training (IJT) in the units. Specific information regarding the resources and methods used, the people involved in

IJT, and who actually has the responsibility for IJT in the unit was extracted from the interview protocols.

Most interviewees were familiar with the term "Individual Job Training." The following table enumerates the responses given to a probe of IJT methods and resources used most by soldiers in the interviewee's unit:

	<u>% of Senior Enlisted</u>	<u>% of Officers</u>
	(N=118)	(N=29)
On-the-job training	35%	44%
Soldier's Manual	14%	10%
SQT notices	9%	10%
Job books	10%	-
TEC tapes	8%	13%
Formal classes	16%	10%
Field and technical manuals	5%	3%
Training aids	2%	-
Mini-tests	-	3%
Field experience	-	8%
SQT feedback	-	3%

Thus, the single most frequently mentioned manifestation of IJT was on-the-job training, where soldiers can receive individual attention, supervision, and training on directly relevant skills. It is most probable, of course, that OJT training would take place along with use of the other above-mentioned resources.

A wide variety of personnel were considered to be directly responsible for the conduct of IJT:

	<u>% of Senior Enlisted</u>	<u>% of Officers</u>
	(N=130)	(N=48)
Squad or section leader	51%	63%
Platoon leader	26%	15%
Work supervisor/NCO	6%	6%
Company commander	5%	4%
Training NCO	4%	2%
Other NCO	7%	3%
Others	1%	7%

These data only marginally capture the information obtained regarding specific unit implementations of IJT. The general impression of the interviewers is that, while specific procedures were unique to each unit, all senior-level

personnel were aware of their training missions and considered IJT an important, worthwhile concept. Furthermore, many interviewers echoed the EPMS philosophy of the congruence among training, testing, and performance.

SQT Training

Information concerning how soldiers are trained for the SQT, who does the training, the effectiveness of the training, and suggested improvements in it was distilled from several questions in the senior interview. The following discussion will summarize the information obtained concerning these issues. Many of the interviewees were directly involved in this aspect of training; hence, these topics provoked substantial discussion. Unfortunately, there were substantial differences in SQT training among units, due in part to when the interviews took place. Therefore, a clear picture did not emerge regarding general Army-wide policies and procedures. Nevertheless, the numerous different implementations for SQT preparation could provide some suggestions to those responsible for training at the unit (or higher) level.

As further background information regarding the senior-level personnel interviewed, a total of 62 percent (of 136) of the senior enlisted personnel and 57 percent (of 54) of the officers reported being directly involved in or responsible for the SQT in their respective units. Of those involved in the SQT, 31 percent (of 82) of the senior enlisted personnel and 55 percent (of 29) of the officers said they had major responsibilities; these responsibilities ranged from "complete responsibility for all phases of SQT training and preparation" for several people to "scheduling of SQT classes," and "conduct of training."

Practically all interviewees (91 percent of the total sample from both groups) claimed that there was formal, scheduled training for the SQT in their units. This formal training usually was reported to consist of either scheduled classes, scheduled hands-on practice sessions, or both. The breakdown of codable responses as to the content of the SQT training is as follows:

	% of Senior Enlisted (N=127)	% of Officers (N=50)
Classroom and hands- on practice	33%	40%
Classes on written component only	19%	6%
Practice on common soldier tasks	3%	6%
Practice on hands-on component only	15%	6%
Practice on all tasks in SQT notice	29%	42%

When asked specifically who conducted this training, several answers were obtained:

	% of Senior Enlisted (N=167)	% of Officers (N=53)
Squad leader	32%	23%
Training NCO	5%	11%
Battalion- and Company-level personnel	9%	15%
Platoon leader	24%	19%
Battalion-level personnel	6%	2%
Others NCOs	21%	19%
Job experts	-	8%
Other soldiers	3%	3%

When asked whether they considered this training adequate, responses were as follows:

	% of Senior Enlisted (N=116)	% of Officers (N=53)
Adequate	52%	52%
Inadequate	26%	10%
Some parts adequate, others inadequate	18%	25%
Too early to tell	4%	12%

There are some striking features of these results. The first is that there is substantial variability in both the content of training and in who actually conducts the training. We can only conclude that, though substantial training appears to be given, there are no systematic procedures or uniformity of instruction provided. This is not to say that procedures within a particular unit are haphazard; on the contrary, the interview protocols seemed to indicate fairly tight and rigorous schedules. Rather, the point is that different units are conducting training in different ways. While this might be a function of individual unit missions or other extenuating factors (e.g., lack of manpower or equipment; other training demands), we consider it likely that there is no Army-wide doctrine being consistently followed. This is consistent with the general Army position that is moving the responsibility for the conduct of both individual and collective unit training away from centralized control and toward decentralization.

Another feature of these results is the finding that half of the interviewees consider SQT training other than adequate. Several respondents had specific suggestions as to how to improve the training:

	% of Senior Enlisted (N=107)	% of Officers (N=28)
Provide more time for training	19%	14%
Get better trainers	6%	11%
Use more training aids	7%	4%
Make more equipment available	7%	-
Include more hands-on practice	10%	4%
Include more common soldier tasks	-	4%
Include more MOS tasks	-	7%
Include more written tasks	-	7%
Change the level of responsibility	-	4%
Task-specific suggestions	51%	18%

A final topic of conversation concerning the SQT involved ascertaining senior-level opinions on the mechanisms developed to provide feedback to soldiers once they had taken an SQT. In addition to probing for information concerning the logistics of the process, they were asked if they thought soldiers understood the standard feedback form and whether this system for providing information to soldiers was working as intended. Results are as follows:

	% of Senior Enlisted (N=127)	% of Officers (N=52)
Do soldiers understand the feedback?		
Yes, without help	23%	13%
Yes, if given help	41%	29%
No	4%	2%
Don't know	32%	46%
Does the feedback system work?	(N=124)	(N=52)
Yes	35%	25%
For the most part	17%	21%
Sometimes	2%	4%
No	9%	13%
Don't know	37%	37%

As a summary of information regarding this topic, staff members made two overall judgments of each interview which characterized the interviewee's opinions regarding the SQT system in principle (i.e., the idea of performance-based testing, the SM, SQT Notice, the actual SQT) and in practice (i.e., how it is actually working). Results are as follows:

	% of Senior Enlisted (N=145)	% of Officers (N=46)
<u>In principle</u>		
Very positive	13%	17%
Positive	44%	57%
Negative	14%	13%
Very negative	6%	0%
Can't tell from interview	23%	13%
<u>In practice</u>	(N=134)	(N=46)
Working very well	4%	4%
Working adequately	29%	52%
Not working	45%	32%
Can't tell from interview	22%	12%

These findings and their implications will be discussed at length in Chapter VII.

Soldier's Manual

A major focus of the interviews was to get senior-level personnel opinions regarding the SMs. It was possible to codify and enumerate responses to questions involving four aspects of the SMs. There were the senior-level personnel's perception of:

- SM availability and unit-level support for SM use;
- Physical characteristics of the SMs;
- Soldier's comprehension of the SMs; and
- Soldier's usage of the SMs.

Availability and support. In general, senior-level personnel thought that SMs were rather easy to obtain. Post-hoc categorization of responses to "How available are SMs to soldiers?" were as follows:

	% of Senior Enlisted (N=126)	% of Officers (N=49)
Very easy to obtain	72%	61%
Can be obtained if one tries	13%	22%
Not very easy to obtain	6%	12%
Very hard to obtain	6%	4%
Impossible to obtain	3%	-

As to how the SMs were distributed, responses were:

	% of Senior Enlisted (N=143)	% of Officers (N=50)
In AIT	4%	4%
From assigned unit	59%	54%
Both	23%	38%
Other	12%	2%
Don't know	-	2%

The other relevant issue was whether or not there was formal training given in the Unit on the use of the SM. There was high agreement between senior enlisted and officer personnel; 30 percent (of 126) senior enlisted and 31 percent (of 52) officers said that formal training was given. In the comments to this question, there were wide differences among units in amount and quality of the formal training, ranging from several regularly scheduled classes conducted by special training officers to single-session familiarization meetings conducted by platoon or squadron leaders.

Thus, it appears that, while SMs are available to soldiers, and hence the mechanisms for the manual's production and distribution are effective, there is at best an irregular pattern of formal training in their use. The proportions reporting

formal training corresponds to the proportion of soldiers who reported receiving help in the use of the SM (36.5% of all respondents). While the data reported in Chapter III indicate that formal training in the use of the SM might not be necessary (i.e., there were very few problems associated with comprehension of SM purpose or use), the "SM help" variable correlated highly with overall usage (cf. Chapter IV). The inference is that in order to increase SM usage, and concomitantly soldier's performance, more formal instruction in SM use would be a worthwhile investment of training resources.

Physical characteristics of the SM. Opinions of senior-level personnel were solicited regarding comments they had heard or their own personal experiences related to the physical characteristics of the SMs. These opinions paralleled questions asked of soldiers about these same issues; thus, a comparison might give some indication of the validity and/or ubiquity of particular problems. It should be realized, however, that the senior-level opinions were usually based on second-hand information and might be biased in unpredictable ways.

Codable responses to these questions were as follows:

	% of Senior Enlisted Reporting Problems	% of Officers Reporting Problems	% of soldiers Reporting Problems
Size	23% (N=118)	18% (N=40)	14% (N=987)
Bulk	11% (N=118)	13% (N=41)	17% (N=987)
Binding	31% (N=122)	12% (N=39)	47% (N=987)

The inconsistencies, both between the two senior-level types and between both types and the soldiers, seem to indicate that soldiers do not communicate their problems clearly to their superiors. If all senior-level percentages were lower than soldiers, it might be argued that problems were being filtered before reaching supervisors; on the other hand, if the senior-level percentages were uniformly higher than soldiers, it could be argued that they are informed only about problems. The mixed pattern is inconsistent with both arguments. The only generalization that can be drawn from these data is that senior-level personnel do not have an accurate notion of problems soldiers report having with their SMs.

Comprehension. As above, senior-level personnel were asked a parallel series of questions to soldiers regarding dimensions of SMs related to comprehension. Again, questions were framed in terms of comments they had heard or personal experiences they had had regarding problems. Codable responses were as follows:

	% of Senior Enlisted Reporting Problems	% of Officers Reporting Problems	% of Soldiers Reporting Problems
Purpose	14% (N=117)	6% (N=50)	4% (N=987)
Locating Information (Can't Find)	13% (N=114)	2% (N=48)	11% (N=987)
Language (Words Hard)	24% (N=116)	26% (N=51)	8% (N=987)
Format	3% (N=112)	4% (N=49)	No equiv. ques.
Information Missing	39% (N=70)	17% (N=47)	16% (N=987)
Errors in SM	38% (N=70)	13% (N=47)	42% (N=987)

The striking feature of this compilation is the discrepancies among the three sources of information. In particular, many senior-level personnel reported having heard about (or personally experiencing) problems with the language in the SM. There were several reports from the senior-level personnel of bilingual soldiers having difficulty; this was not a reported problem from the soldiers. The conclusion is again that senior personnel apparently are receiving at least a different, if not a somewhat distorted, picture of the SM, as compared to soldiers who actually use them. Of course, the counter-hypothesis could also be true -- namely, that soldiers in the survey gave a distorted picture. While the former is more likely, the key point is that the results are not consistently comparable.

SM usage. Finally, the senior interviews solicited opinions regarding some general dimensions of soldier SM use. At the overall level, they were asked to estimate how many soldiers under their jurisdiction used SMs. A comparable figure reported by soldiers was 82 percent (of 1,224) who used the SM for any purpose. The results of the senior interviews were as follows:

Responses	% of Senior Enlisted (N=131)	% of Officers (N=52)
Everyone does	4%	8%
Almost everyone does	11%	15%
A lot do	11%	8%
Half and half	5%	8%
Less than half	11%	17%
Few	31%	23%
None	11%	9%
Don't know	6%	12%

Clearly, there is an inconsistency between these figures and the 82 percent usage reported by the soldiers themselves. When probed, however, the senior-level personnel accurately described the typical pattern of SM use for the soldier: 77 percent of the

senior enlisted personnel reported increased SM use when the SQT was announced (N=114) and when the SQT Notice was distributed (81 percent of 91 respondents). Comparable figures for officers were 92 percent (of 50) when the SQT was announced and 83 percent (of 46) when the SQT Notice was distributed. Thus, while their perception of overall SM usage is not accurate, senior-level personnel support the conclusion reached from data obtained from the soldiers themselves that use of the SM is driven by the SQT.

Commander's Manuals and Job Books

A final area of inquiry pursued during the senior interviews was their knowledge and use of two other documents: the Commander's Manuals and Job Books. The purpose of these interview items was not to investigate either of these documents systematically; rather, it was to get a general impression of how widespread and useful they were perceived to be.

Both types of senior-level personnel were asked four general questions concerning each document. The questions and the obtained responses were as follows:

	% of Senior Enlisted			% of Officers		
	Yes	No	No Answer	Yes	No	No Answer
1. Do you have a copy of: a Commander's Manual?	31%	64%	5% (N=125)	65%	29%	6% (N=55)
a Job Book?	56%	44%	0% (N=141)	46%	50%	4% (N=52)
2. Do you use: the CM?	64%	36%	0% (N=36)	89%	9%	2% (N=35)
the Job Book?	78%	22%	0% (N=31)	39%	61%	0% (N=23)
3. Is it useful? CM	92%	8%	0% (N=26)	74%	11%	15% (N=35)
Job Book	86%	14%	0% (N=56)	67%	33%	0% (N=9)
4. Could it be improved? CM	24%	76%	0% (N=21)	18%	36%	45% (N=33)
Job Book	41%	59%	0% (N=39)	33%	11%	56% (N=9)

VII. GUIDELINES AND RECOMMENDATIONS

Introduction

Taken as a class, the Soldier's Manual should be among the most widely used set of documents in the Army. Not only do they have a large, well-defined audience, but they have an important role to play for that audience. Each SM should, therefore, be as effective as it is possible to make it -- it should be easy to get, easy to use, easy to understand, and efficient in conveying information that the user will find to be of practical value in the performance of his or her various military duties.

It should not be surprising to find that any document would fall short of such high standards; that a relatively new document, placed in a complex environment in which a wide variety of similar documentation already exists, should prove to fall short is highly probable. This section of the report, therefore, will discuss the identified problem areas, based on the data obtained, as well as those problem areas where the evidence is less direct and of a secondary nature. It will also discuss changes in the SM and in the way it is used that would represent possible improvements.

Naturally, the recommendations made here need to be considered not only in the light of their possible inherent value but also in terms of their estimated cost. While it is not possible to make accurate estimates of such costs, the general nature of the resources needed will be noted where appropriate.

The order in which this material is presented will, in general, follow the order of topics in the previous sections of this report. Supporting data for, and detailed discussions of, most of the recommendations will be found in these earlier sections. Where extrapolations of the data are made, or where other lines of argument are used to support a recommendation, they will be discussed here along with the recommendation itself.

DOCUMENT CHARACTERISTICS

Physical Characteristics

To the extent that the Soldier's Manual serves its fundamental purposes as a personal job and skill manual, it will get very hard use. It would be ironic, indeed, if its very effectiveness led to its physical deterioration. For example, a number of soldiers in the combat arms MOSs (especially in Europe) reported in their critical incidents and personal interviews that they took their SM with them on field exercises (or were told to

do so). The intent was to enable them to practice tasks in the SM during breaks and other down time.*

How well do the Soldier's Manual stand up under such conditions? The evidence from the study suggests that, as a class, they are not sturdy enough to withstand constant use, and especially not under field and/or shop conditions.

Approximately one-half of all respondents surveyed indicated a problem related to the binding of the SM. It is, therefore, recommended that the nature of the bindings of all SMs be re-examined, along with the related issue of number of pages. Steps need to be taken to make it less likely that the pages become loosened and fall out. Possible approaches include:

- a. Remove Common Soldier Tasks from SMs that have them (68% of the SMs in the sample have all of them and another 24% have some.) This could save approximately 20 pages in many cases.
- b. Consider a kind of binding that would allow the SM to lie flat. The staples currently used are not only an insecure fastening, but they make it difficult to use the larger manuals on the job, where the user may need both hands free in order to perform the tasks.
- c. Consider separating those manuals that have skill levels 10-40 bound together (e.g., MOS 16P and MOS 16R that now contain 106 and 125 pages respectively). Even skill levels 10 and 20 need not necessarily be bound together & presently directed by TRADOC.

These changes would require relatively small adjustments in the printing and binding of SMs and should involve only a modest increase in the cost per document. And yet, unless such changes are made, efforts to increase the use of the SM may be counter-productive.

Purpose, Completeness, and Job Relevance

These areas broach a variety of critical issues related to the usefulness of the Soldier's Manual as an individual training and test document.

*A quote from TRADOC Circular 351-28, dated 4 December 1978, shows that the SM is seen by the Army as being an on-the-job guide in many cases: "If the soldier does not use a job aid, technical manual or field manual, etc., in the on-the-job performance of the task, the SM must include performance measures in sufficient detail to permit a soldier to use the SM as a sole reference source." (Chapter 2, section 2-5, paragraph b (2).)

Reviewing the content of a variety of SMs and examining the data obtained in the study leads to one inescapable conclusion. Neither the intended nor the perceived purpose of the SMs is clearly understood and agreed upon by those who produce them and those who use them. This makes a discussion of purpose, completeness, and job relevance problematic because the criteria for judging these factors are themselves ambiguous. The desire to standardize all SMs is understandable. But, the need to do so is not supported by the findings of the study.

The statement in TRADOC Circular 351-28 (dated 4 December 1978) makes it clear that the SM is supposed to be a "well illustrated on-stop training and evaluation guide," one that "describes in detail the tasks that are critical. . . ." Also, as noted in the earlier footnote, the SM should be a soldier's "sole reference source" for on-the-job performance if other documents or job-aids are not used for this purpose.

In effect, these statements make it clear that the SM, if possible, should be able to carry the major if not the sole burden for most tasks. (The task examples in Appendices A, B, C, and D of the TRADOC Circular support this contention, although they are not "well illustrated" and they require a prior knowledge of terminology, which one assumes is obtained at AIT.) The fact is, however, that for a number of SM users in the study, the SMs cannot carry the burden alone for task completion (39%), contain (perceived) errors (42%), and are not seen as being job related (73%). These results pretty much cut across Proponent School and MOSs.

Treating the SM as a one-stop job support document puts major emphasis on the quality and completeness of the task analyses that are (or should be) the major inputs to the SM. The decision whether or not to include a task, or to provide detailed or general guidance for its performance, must be based on complete, accurate, and current job/task analytic information. As 351-28 points out, "Task analysis is not an academic exercise. Since it is a tool used in developing many training products (i.e., SMs, SQT, etc.), it must be useful for all of them." In short, the tasks that are described in the SM reflect the quality of the prior analytic work that was carried out.

In the senior-level interviews, the question of completeness of the SM was raised. The results seem to speak clearly to these issues and the lack of clarity surrounding them. Thirty-nine percent of the E5-9s interviewed, for example, thought the SM should be more complete and that information was missing; 23 percent thought that they already contained too much information and that their content should be reduced.

In view of these general findings, the notion that the purpose and completeness of the SM should be allowed to vary with the nature of the MOS is one that should be given serious consideration. When a task can be described in sufficient detail

(within the SM format) so that the majority of soldiers (with appropriate AIT and job experience) can complete it to meet the appropriate performance measures and task standards, it should be included in the SM and noted as being "self-contained." When this is not possible due to length and/or complexity, and another source is required to supplement the SM for the majority of soldiers, a different tack should be taken. The basic step should be listed but with the needed reference(s) clearly noted and the relevant section or sections from those references given. * This would serve to alert the soldier that he or she is not expected in this instance to be able to use the SM by itself. (The needed documents should of course be readily available if such an approach is to work effectively.)

It is recognized that too heavy a reliance on other documentation to support the SM is probably undesirable. And yet, to require that the SM be a one-stop document for MOSs that have many complex tasks would exacerbate the bulk/binding problem noted earlier. It is, therefore, seen as a more sensible approach to allow the Proponent Schools to define the purpose, scope, and content of each SM and then to articulate that information clearly to the users. **

This recommendation, while profound in its ultimate impact on the nature and use of the SM, is not seen as involving a significant expenditure of resources. For some schools it might well result in cost savings, since the SM will undoubtedly become smaller where existing documentation can be used to better effect; for others, the need for additional task analytic work and refinement/expansion of the content of the SM may be required. However, the net effect should be a more practical document, one that more closely meets the individual needs of each MOS.

Readability

Clearly, a document that is not comprehensible to the average reader is not going to fulfill its purpose, even if that purpose is very well defined. It came as a surprise to the project staff that most soldiers reported finding the words in the SMs "easy to understand." Since this question reflected on the reading ability of the respondents themselves, perhaps this result is to be expected. (Senior-level personnel similarly thought that the language level was "OK.") It was, therefore, especially

*For some MOSs, this appears to be done now. A reference document is sometimes listed under "materials needed," although the need for that document was not empirically checked by the project staff.

**Supporting evidence is suggested in the analysis of usage data. Non-combat MOSs tended to use the SM less than combat MOSs (71% vs. 95%, respectively). Soldiers with "regular jobs" may not need the same kind of SM as do those who must engage in simulated practice to even approach their "real" jobs.

instructive to carry out an actual analysis of the reading level of a sample of passages taken from the task descriptions in all the SMS used in the study. The actual grade-level scores for each MOS and skill level are presented in Table 1 of Chapter III of this report. For the 72 books examined (three MOSs had no Skill Level 30 SM), the following distribution of grade levels was found:

Grade Level	Number of Books
15 & above	3
14 to 15	3
13 to 14	4
12 to 13	10
11 to 12	13
10 to 11	21
9 to 10	12
8 to 9	5
7 to 8	1
6 to 7	0

The average reading level for all Skill Level 10 books is 10.351; for Skill Level 20 books it is 10.94; and for Skill Level 30 books it is 12.17.

It is recognized that a readability score is only a rough guide to the comprehensibility of narrative material. Technical writing is particularly subject to a high-grade-level bias due to the inflation caused by poly-syllabic technical terminology. However, it still remains a fact that the scores reported above are consistently above the average reading level of the Army enlisted person and should be a cause for concern among those who prepare SMs. Working toward the achievement of readability scores consistently at or below the average Army grade level is a recommendation that can certainly do no harm and has the potential to do considerable good.

FIELD TESTING SMS

There is no way to ensure that any document designed to convey information meets its intended purpose without its being tested with the target audience under realistic conditions. The data clearly show that procedures used at the time the SMS used in this study were prepared were not adequate to deal with problems related to completeness, accuracy, and job relatedness.* It is therefore recommended that a test and revision cycle, using actual job incumbents, be initiated for all subsequent SM preparation work; where possible, this should include the reissue of existing SMS. The essential steps of such a procedure are as follows:

*Early Soldier's Manuals (at least) were produced under extremely heavy time pressures.

1. Select tasks to be used in next SQT cycle beginning with Skill Level 10/20.
2. Obtain best available analytic data on each task.
3. Obtain new task analytic data on tasks where needed and as time and resources permit.
4. Decide on need for supporting documentation and the level of detail to be included in the SM. (See earlier recommendation on purpose, completeness, and job relevance.)
5. Prepare draft versions of the SM for the tasks selected.
6. Option (1) - Test each task and its component steps on basis of comments obtained from both members of SM-user audience and their immediate supervisors. Information should be obtained in one-to-one or small group interviews.

Option (2) - Test on basis of observation of users actually performing the tasks in real or simulated job conditions, following the steps as specified.

Option (3) - Divide up tasks so that Option (2) can be followed where possible and remaining tasks follow Option (1).
7. Analyze results and revise SM as needed. Revisions in supporting documentation, the SQT Notice, and/or the SQT itself may also be indicated.
8. If changes are significant, return to Step 6 and repeat until SM is performing satisfactorily.

Although the scope of such an enterprise could be considerable, the benefits to the entire EPMS would be significant. Results would indicate not only the real usefulness and job relevancy of the SM per se, but would provide information on the quality of the task analyses upon which they are based, and the job relevancy of the SQT itself. It would also allow a test of the assumptions being made about the skill and knowledge level of graduates from AIT, and whether the Individual Training Plan (ITP) was correct in its allocation of tasks to their source of mastery. This recommendation also provides an opportunity to test the value of the earlier recommendation that schools be allowed to define the scope and content of the SM.

Such pre-testing could be done best by the Proponent Schools themselves, which would have the most to gain from the resulting improved SMs. Done initially on a pilot basis for those tasks to be tested on the next SQT cycle, at the important 10/20 skill levels, the field test program could then be expanded so that additional tasks could be tested at higher skill levels.

The implications of such a recommendation are, of course, far-reaching. It would require additional time and considerable resources so that the necessary test and revision steps could be carried out. However, with such a test program, the purpose, usefulness, and viability of the Soldier's Manual concept will be significantly enhanced. Without such a program, it is feared that the purpose, completeness, and job relevance of SMs may continue to be problematic.

USAGE CHARACTERISTICS

Given the relationship between the SM and SQT, it is not surprising that SM usage is largely driven by the scheduling of the SQT. The questionnaire, the senior-level interview, and the critical incident data all support this view. For example, nearly half of the senior-level enlisted (N=131) and officer (N=52) personnel who were interviewed indicated that from "less than half" to "none" of the soldiers under their charge used the SM at all, but that those who did use it did so primarily for purposes of studying for the SQT (49% senior enlisted and 61% officer personnel expressed this latter view). In terms of general level of use, 77% of senior enlisted and 92% of officer personnel said that SM usage increased substantially when the date for the SQT was announced (usually coinciding with the arrival of the SQT Notice).

These senior personnel were also generally critical of the SM as a training document. Half of them stated that the SM in its present form was not really very useful to the typical soldier (although 90% of them thought that it ought to be).

Support for the low level of visibility of the SM also comes from the results of the soldier interview data. When asked, "What is the normal way for a soldier to advance from one skill level to another skill level? Be as specific and detailed as you can," only 19% (N=353) mentioned the SM, the SQT Notice, or the SQT itself!* When asked if any specific documents are provided to the soldier to help in his or her skill level advancement, 78% of those interviewed said yes, but only slightly over half of them (52%) specifically mentioned the SM. Thus, 59% of those interviewed did not identify the SM as an aid to individual advancement in the Army.

*E5s and E6s had somewhat higher percentages; E3s and E4s, lower. There was no trend by specific MOS; but by Proponent School, Infantry, Aviation, Admincen and Military Police all had consistently higher averages.

These findings suggest that the level of support for the SM (as of mid 1979) may not be very high. Coupled with the finding that usage tends to be externally driven by the SQT, one must conclude that SM usage is not seen as a routine part of the soldier's individual job training activities.

Added significance can be given to these findings concerning the SM when the senior-level-interview data are looked at for the overall SM and SQT system as a principle and as a reality. As reported in Chapter VI, the results are as follows:

Is the SM/SQT system for individual job training and advancement good in principle?

	Officer	Senior Enlisted
Very Positive	17%	13%
Positive	57%	44%
Negative	13%	14%
Very Negative	0%	6%
Attitude Not Determined	13%	23%
	<u>100%</u>	<u>100%</u>

Is the system working in practice?

	Officer	Senior Enlisted
Very Well	4%	4%
Adequate	52%	29%
Not Working	32%	45%
Attitude Not Determined	12%	22%
	<u>100%</u>	<u>100%</u>

The general trend in these data is clearly supportive of the principle of a criterion and performance-based training and testing system, supported by a task descriptive and skill-based document such as the SM. But it is equally clear that many are critical of the way that system is actually working in practice.

While it was not the intention of this study to assess the SQT/SM "system," it remains a key finding of the study that to the extent that the SM is seen to be useful, its use is defined by both user and supervisor alike primarily in terms of taking the SQT. And to the extent that qualifying on the SQT is seen as an important element in one's promotion through the ranks, the SM then becomes an important part of one's career progression. The latter notion, however, is not well articulated by the average soldier due, perhaps, to the ambiguity, if not outright

confusion, on the relationship between SQT and promotion among those interviewed.

It could be (and has been) argued that the SM should be formally divorced from the SQT (and, therefore, the promotion system), that it should be presented to the soldier only as an individual job support and skill-building document. However, as long as the SQT exists and as long as the tasks included in it are drawn from the SM, it is unlikely that the separation between the two can be maintained. What is critical to their mutual success is that they both reflect a high degree of job relevance and that the SQT reflect a high degree of test and scoring integrity. To the extent that either of these becomes eroded, or are perceived to become so (and the data in the previous table reflect a number of remarks to that effect), the SM will be seen as a "requirement" rather than as a document central to one's real job proficiency and career advancement.

Several quotes from the senior-level interviews are presented here to provide some of the "flavor" of the remarks that support the above discussion and to capture more accurately the thinking of those who must support the SM and the SQT if the system is to work effectively.

1. The SM and SQT are the way to go in theory but there are lots of practical problems.
2. The SM is not integrated into the training system in general; usage (what there is of it) is keyed to SQT activities.
3. The SQT Notice is more central than the SM insofar as the SQT is concerned.
4. SM usage is low priority because the SQT is not seen as being clearly tied to promotion (as originally intended). This makes the whole SQT process (including use of SM) low priority and undermines the incentive to do well. Perhaps it shouldn't be at this point -- not until the tasks are validated.
5. SM tasks and job tasks are often different. This makes the SM/SQT notice an important document but only to pass the SQT.
6. The SM is most often called the SQT Manual because it's used for the SQT test almost exclusively.
7. The system needs to be made to work as intended as soon as possible or it will be compromised.
8. The SQT should relate to the job, not things he or she doesn't do every day.

9. The promotion and SQT relationship is key; credibility will suffer if that isn't strengthened.
10. The present system emphasizes numbers and should be an evaluation with feedback to help the individual do his job better.
11. The EPMS is seen by some as a requirement to be met any way it can rather than as an effective training and management tool.
12. The way tasks are done in the field (or on the job) is perceived to be (and is) different in many cases from the way they have to be done to pass the SQT. Thus, one "trains" to take the SQT as a requirement of the system, not to help do the job better. Test standards are also more strict than they need to be.
13. Reading and studying about a task can be more difficult than doing it. Not everyone is a bookworm.
14. Many soldiers aren't working in their MOS, making the SQT a particular problem for them.
15. The SM is seen by most as a "good idea," as is the EPMS in general. It is going through growing pains. It can go four ways:
 - (1) Survive and be useful, (2) Survive and be a requirement, (3) Survive and be a problem, (4) Not survive.

It is too early to tell which of these will, in fact, take place!

The last comment is particularly insightful. The real danger is that the SM and SQT system will be seen as part of a set of "requirements," at which point the system will have lost much of its true value. The key to preventing this from coming to pass is the role played by those most responsible for carrying out IJT -- the squad and platoon leaders (75% of those interviewed gave these individuals the major responsibility for conducting IJT). This is especially true of those in the non-combat MOSs, where SM usage tends to be weakest and most related to the "requirement" to pass the SQT, and of those in the lower ranks, where usage is also lower. The motivation to maintain proficiency in areas not directly related to one's daily job is especially problematic for these people. They are too busy doing and learning their relatively new jobs to be concerned with career or with other tasks within their MOS for which they

are technically responsible, but for which they get no practice. Only by strong and consistent leadership from middle-level management could these persons be motivated to use the SM as intended. In turn, such leadership at the field level can be expected only when those at higher levels, who are responsible for preparing the SM and designing the SQT, provide high quality materials, and reward and support those who use them consistently and well.*

The recommendation here is really heavily dependent on the improvement in the existing materials, as discussed above. There is (or was) a strong commitment to support the SM in principle, but serious reservations (if not outright pessimism) about the ability of those "in charge" to correct the problems perceived in the present system. A visible, real, and timely response to these problems will probably lead to real changes in the "climate" of support for the use of the SM. And the data in this study clearly show that that climate of support is an essential ingredient to such use.

SUMMARY REMARKS

One of the hypotheses to be tested by the study was the degree of relationship between the use of the SM and the ability to perform one's job -- the latter to be measured by means of the SQT scores of those in the study sample and by self-confidence ratings. As noted in Chapter V, a number of analyses were conducted that established the strong presumption of a positive relationship between SM usage and SQT scores and confidence ratings. In fact, the several independent analyses carried out provide a kind of concurrent validity to the hypothesis, and lead us to (technically qualified) support of the relationship. There is also evidence that the "quality" of the SM itself is related to the SQT scores and self-confidence ratings, although one needs to realize that the data are not sufficiently robust to allow one to be certain that other factors did not account for the findings. Given the fact that the SM and SQT, as embedded in EPMS and IJT, are fairly new (and were even newer when the data were collected), and that there were admitted (and not unexpected) problems with the SMs preparation, distribution, and utilization and with SQT preparation, administration, and scoring, one feels safe in saying that the relationships between SM usage and the ability to perform one's job will become even stronger as these deficiencies are corrected.

*There is considerable evidence from the data that the SM was almost completely ignored in AIT for those in the study sample. While it is recognized that the SM was new for some and nonexistent for others when they attended AIT, it is an area that should not be ignored as we look for ways to increase knowledge of, and respect for, the SM. See also Appendix C for further support of this point.

In short, improvements in the SM per se and increases in its level of use are very likely to have a real and positive impact on the individual job proficiency of soldiers in a wide variety of MOSs. This reasoning leads one to conclude that the implementation of the empirically based recommendations made in this section would contribute to improved job performance.

Each of those on the project staff who spent many, many hours in the field talking to those who use and/or manage the use of the SM, came away with a mixture of optimism and concern -- optimism based on the fact that a technically sound and integrated system of individual training, testing, and advancement had been designed and was being implemented on a vast scale (perhaps too vast), and concern based on the delicate balance that seemed to exist between its support and success and its dis/mis-use and failure. There is a long and honored tradition in the military to complain, and one needs to take that into account. But one also needs to look beyond this. We feel confident that we have done so and have documented real, legitimate, and meaningful concerns. Furthermore, we believe that the viable survival of the SM and its associated elements (as opposed to their physical survival and doctrinaire use) will depend upon a timely and meaningful response to those concerns.

The above recommendations are seen as clarifying and strengthening the relationship between TRADOC and the Proponent Schools vis a vis the SM. A review of the implications of the study in that context will end this chapter.

The Proponent Schools must reassess the accuracy and relatedness of their SMs through a continuing effort to improve the quality and currency of their job and task analysis activities. Furthermore, each School should field test each task considered for inclusion in the SMs for which it is responsible. Revisions based on new or modified equipment or new ways of doing a task should be timely and should not require the reissuing of the entire SM. Proponent Schools should also be responsible for monitoring the reading level of their own SMs, with no SM averaging a level higher than the known Army average at the time of issue.

Each Proponent School should be allowed to decide on the role each of its SMs can play in IJT, from the training index concept, to a one-stop, stand-alone document. Based on these study findings, the Combat Arms MOSs should probably lean toward the stand-alone concept; the support MOSs toward the index, with many variations between these based on the needs of the particular MOS and perhaps even individual skill levels. (Common Soldier Tasks should not be included in the SM.) Flexibility of purpose for the SM is essential.

Equally essential is that the purpose for a particular SM be carefully documented in the SM itself in clear and concise terms (perhaps even at task level). Where it is meant to stand alone,

this should be made clear to the user and all references eliminated. Where it cannot, that should be indicated and those specific references that are essential in order to know how to do a particular task should be identified. In cases where the task can only be described generically (e.g., the Admincen MOSs with their plethora of forms and their constantly changing procedures and references), that should be stated and the best guidance possible under the circumstances provided.

Along with flexibility of purpose must come a standardization of format. The basic format as described in TRADOC Circular 351-28, dated 4 December 1978, is workable, although three areas of possible improvement were noted: (1) the use of the term "Performance Measures" seems unnecessarily abstract and could be more directly called "Task Steps;" (2) there should be a place to include, whenever appropriate, initiating cues to performance of the task; and (3) where a task is an integral part of a team effort, note of this should be made.

TRADOC should have primary responsibility for the Common Soldiers Task SM. The decision to place a task in that category, however, should be made in concert with all the Proponent Schools. The SMCT document should be exemplary in every way and set the standard in format, reading level, and job relevance for others to emulate. Tasks in the SMCT should not be repeated in any other SM.

TRADOC should also be the responsible agency to determine ways in which to improve the binding and durability of the SM and to enforce its standardized format.

Some of the recommendations in this chapter may have already been made, or decisions to do so may have been taken. The documentation herein would then only serve to further support such decisions. In other instances, the suggestions may have been considered and rejected, in which case the reasons for such an action were presumably of sufficient weight to render the idea infeasible. If the support provided here further strengthens the argument, perhaps it should be reconsidered.

Finally, there may be notions presented here that are at least partly new and that will require careful thought to see what their full implication would be to existing costs, schedules, and established procedures. Some of the more significant recommendations (e.g., field testing of the SM) are admittedly costly but could be tested on a limited basis first. Others may not be costly, but may require the kind of coordination and cooperation that will take time to work out.

But underlying all the suggestions and all the efforts that have been made (and will continue to be made) on behalf of improved training is the belief that the SM and its related elements represent a basically sound approach to individual skill

building in the modern Army. It is the realization of a concept that has been struggling for recognition and acceptance for many years. Hopefully, the study reported on here, and the recommendations coming out of the study, will enhance the probability that the SM will not only survive, but will be the keystone it deserves to be in building and maintaining individual job proficiency.

ADDENDUM

In the autumn of 1980, the U.S. Army Research Institute administered a short questionnaire to 775 soldiers at Ft. Bragg, North Carolina, concerning the way they prepared for the SQT. The soldiers completed the questionnaire on the same day they took the Skill Component (SC) portion of the SQT. Since the soldiers tested were 11B (Infantry) and 13B (Artillery), and since several of the items on the questionnaire dealt with SM use, this data set provides an opportunity to update some of the findings reported in this document, using a larger number of soldiers within the two MOSs than were available in 1979 (606 versus 78 for 11B and 169 versus 91 for 13B). AIR has looked at these questionnaires in those areas that are related to the 1979 questionnaires to see if the results would support, amplify, or possibly contradict, the earlier findings. The results do, in fact, closely parallel those obtained in 1979. In summary, our analysis of these more recent data produced the following findings:

- The percentage of soldiers who reported using the SM to prepare for the SQT was similar for the 13B MOS (37 percent in 1979 versus 92 percent in 1980) but different for the 11B MOS (93 percent in 1979 versus 76 percent in 1980). The smaller number of soldiers in our original sample would tend to produce a less stable figure, and we are inclined to view the current figure as being more accurate.
- The tendency for SM use to increase with pay grade was found in the newer data for the 11B MOS. The percentages reporting SM use in the E-3 and E-4 grades were virtually the same as found earlier (72 percent in 1979 to 74 percent in 1980 for E-3; 79 percent in 1979 to 77 percent in 1980 for E-4).
- The positive relationship reported between SM use and the soldiers' confidence in his or her ability to perform tasks in his or her MOS was again confirmed at modest but significant levels of correlation ($r=.42$ for 13B; $r=.17$ for 11B).
- The positive relationship between SM use and SQT performance was also generally confirmed at approximately the same moderate (but significant) level of correlation as found in the earlier data. For the overall SQT score the earlier correlations were $r=.25$ for 11B and $r=.10$ for 13B. For the newer data the correlations are $r=.16$ and $.24$ respectively (significant at the .001 level). Given the differences in the specific ways the questions on usage were asked on the two forms, and the closer relationship between the administration of the questionnaire and the SQT itself on the more recent effort, these small variations in r are certainly not

surprising. When the more recent results are translated into average SQT scores, those in 11B who used the SM had a mean SQT score of 80.2 and those who did not had a mean SQT score of 77.1. The comparable figures for 13B are 72.5 and 64.5. Again, using the SM is associated with improved SQT performance.

In summary, the newer findings do not suggest any major differences in terms of SM usage and its relationship to the SQT from the original set of data.

APPENDIX A-1

TRAINING RESOURCES QUESTIONNAIRE

Introduction:

The information you are being asked to provide will be used to help the Army improve its training practices. The answers you give will be used for research purposes only. Your responses will be kept in strictest confidence and your name will not be associated with any of the answers you give.

If you do not know how to answer an item or the instructions are confusing to you, ask for help. It is important that you complete each item as carefully and completely as you can. Are there any questions?

FOR ADMINISTRATIVE USE ONLY

☐ INTERVIEW (Name:)
☐ GROUP QUESTIONNAIRE
 DATE _____
 SITE _____

Name: _____ Last _____ First _____ Middle Initial _____

Social Security Number: _____ - _____ - _____

Unit: _____ Company / Battalion / Brigade _____

STOP. Wait for further instructions.

WHAT WE MEAN BY INDIVIDUAL JOB TRAINING

The term "Individual Job Training" is used in many places in this Questionnaire. It is important that you know what we mean by the term.

Individual Job Training is the training you have received since leaving AIT (Advanced Individual Training) that is designed to increase your ability to perform specific duties and skills in your MOS and duty position. It may be given to you by your training NCO, your platoon sergeant, your company commander, or by a book, manual or film. Individual Job Training does NOT include collective training. That is, it is NOT crew training, or team training, or squad training or platoon training. It is also NOT what you do on a day-to-day basis on your job, even though that may improve your skills. It IS organized and formal instruction that is designed to improve your own personal skills in doing the specific tasks in your MOS.

1. Date of birth: _____ / _____ month _____ year

2. Height: _____ feet _____ inches

3. Weight: _____ pounds

4. Which hand do you write with?

☐ right hand

☐ left hand

5. When did you begin active Army duty?

_____ / _____ month _____ year

6. What is your highest educational level?

(Check one. (✓))

a. ☐ Did not finish high school

b. ☐ High school graduate or GED

c. ☐ Some college

d. ☐ College graduate

e. ☐ Graduate study beyond college

7. Who is your immediate work supervisor?

8. What is your present rank?

E1 E2 E3 E4 E5 E6 E7 E8

9. What is your Primary MOSC (for example, 63B-30)?

10. What is the job title for this MOS?

11. How long have you held your Primary MOS (at all skill levels)?

_____ years and _____ months

12. On the average, how much time do you spend working on things directly related to your Primary MOS?

a. ☐ All of my time

b. ☐ Most of my time

c. ☐ About half my time

d. ☐ Only a little of my time

e. ☐ None of my time

13. Do you like working in your Primary MOS?

_____ Yes _____ No _____ I've never worked in my Primary MOS.

If NO:

Briefly state why you do not like working in your Primary MOS:

Continue with Item 14 on next page.

14. What do you do most of the time when you're not working in your Primary MOS & how long have you done it?

What I Do _____

How Long _____

15. Have you been given any Individual Job Training in your unit on tasks related to your Primary MOS? (Remember what we mean by Individual Job Training.)

Yes, a lot _____

Yes, a little _____

None _____

16. Have you been given any Individual Job Training in your unit on tasks not related to your Primary MOS? (That is, things you noted in Item 14.)

Yes, a lot _____

Yes, a little _____

None _____

17. How did you receive your Primary MOS? (You may check more than one.)

- a. ☐ Army school
- b. ☐ On-the-job training
- c. ☐ Command or unit-sponsored school
- d. ☐ Promotion or reduction in grade
- e. ☐ Reclassification
- f. ☐ Civilian acquired skill
- g. ☐ Other - Explain briefly: _____

18. Do you want to remain in your current MOS?

Yes _____ No _____

19. When did you arrive in your unit? _____ / _____ / _____
month year

20. Do you plan to reenlist?

Yes _____

No _____

Don't know right now _____

21. When is your ETS (Expiration Term of Service)?

month / year

STOP. Wait for further instructions.

22. We would like you to pinpoint some key events in your Army career. We have provided a "time line," covering two and a half years, that is divided into months. In the spaces under this line write the number for each event listed below that applies to you. Write the number in the space or spaces that shows the time the event took place. If you are not sure of the exact months, just try to be as accurate as you can. You may use the same number more than once if it applies. You may also find that more than one event took place in some months. Write in as many event numbers as you need to for any month.

Do not overlook any events that apply to you. For those events that took place before 1977, write the numbers in the space that says "Before 1977."

Before 1977												1977												1978												1979											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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Event # Event

- (Check on the appropriate line if the event does not apply to you.)
- 1 - I took my SQT.
 - 2 - I am scheduled to take an SQT.
 - 3 - I received a booklet called the SQT Notice.
 - 4 - I received a personal copy of a Soldier's Manual (SM).
 - 5 - I used a Soldier's Manual (SM) to prepare for an SQT (Skill Qualification Test).
 - 6 - I received training from my supervisor/unit to help me pass my SQT.
 - 7 - I personally trained for the SQT.
 - 8 - I received my SQT score.
 - 9 - I was promoted after taking my SQT.
 - 10 - After taking the SQT, I changed duty position from _____ to _____. (Fill in blanks.)

When wait for further instructions.

23. Do you have or have you ever had your own copy of the booklet called the SQT Notice?

- a. ☐ I now have the SQT Notice for MOS
(Fill in blank)
- b. ☐ I now have an SQT Notice but I don't remember which one.
- c. ☐ I used to have an SQT Notice but don't have one now.
- d. ☐ I have never had an SQT Notice.

24. Have you ever received any help or instructions from your unit on how to use the booklet called the SQT Notice?

Yes _____ No _____

Was the help you received from your unit:

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not useful

How was the help or instruction provided and by whom?

STOP. Wait for further instructions.

Column I

25. Have you ever taken an SQT?

Yes No

Go to Column II

Have you ever used the SQT Notice booklet to study for the SQT?

Yes No

About how many weeks before you took the SQT did you start training to prepare for it?

weeks

On the average, how many hours per week did you spend training for the SQT?

hours per week

↑
↑
↑
↑
↑
↑
↑
↑
↑
↑

Continue Column I next page.

Column II

Have you ever used the SQT Notice booklet to study for the SQT?

Yes No

Go to Column III

Have you trained in any other way for the SQT?

Yes No

How did you do this & what did you use?

STOP. Wait for further instructions.

Continue Column II next page.

Column I

26. How many of the tasks in the SQT were covered by the Individual Job Training you received in your unit?

- a. () All of them
- b. () Most of them
- c. () A few of them
- d. () None of them
- e. () I didn't receive any Individual Job Training

27. We would like to know more about the most recent SQT that you have taken.

a. What was your SQT score?

_____ I haven't received my score yet.

_____ I don't remember my score.

_____ My score was _____ A correct.

b. Did you verify/qualify?

_____ I did not verify in my current Skill level.

_____ I verified in my current Skill level.

_____ I qualified for the next higher Skill level.

_____ I don't remember.

c. What effect, if any, did your score have on:

Your plans for taking the next SQT?

_____ Your training activities?

Continue Column I next page.

Column II

26. How many of the tasks in the SQT Notice booklet were covered by the Individual Job Training you received in your unit?

- a. () All of them
- b. () Most of them
- c. () A few of them
- d. () None of them
- e. () I didn't receive any Individual Job Training

27. When will you take the SQT?

_____ I will take the SQT in

_____ month / _____ year

_____ My SQT hasn't been scheduled yet.

Column III

Continue Column II next page.

Column I

28. Did you have enough time to prepare for taking the SQT?

Yes _____ No _____

29. Was all of the equipment you needed to practice for the SQT always available for your use?

Yes _____ No _____ I didn't need equipment for my MOS.

If NO:

Can you name any of the equipment that was not available?

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30. Were the various documents (FMs, TMs, etc.) needed by you to study for the SQT easily obtained?

Yes _____ No _____ I didn't try to use such documents.

If NO:

Can you name any documents that were not available?

STOP. Wait for further instructions.

Column II

28. Have you had enough time to prepare for the tasks listed in the SQT Notice booklet?

Yes _____ No _____

29. Has all of the equipment you needed to practice for the SQT been available for your use?

Yes _____ No _____ I don't need equipment for my MOS.

If NO:

Can you name any of the equipment that is not available?

30. Are the various documents (FMs, TMs, etc.) needed by you to study for the SQT easy to obtain?

Yes _____ No _____ I haven't used any.

If NO:

Can you name any documents that are not available?

STOP. Wait for further instructions.

Column III

(Everyone answer All items on this page.)

1. Did you receive a copy of a Soldier's Manual during or at the end of AIT?

_____ Yes _____ No
_____ At the end _____ I didn't get a
_____ Soldier's Manual
_____ at AIT.

Were you encouraged to use the SM during AIT?

_____ Yes _____ No

Did you take notes in your SM during AIT?

_____ Yes _____ No _____ I didn't get one at AIT.
Was the use and purpose of the SM explained
to you during AIT?

_____ Yes _____ No

12. Have you ever lost or misplaced a Soldier's Manual?

_____ Yes _____ No

Did you replace it?

_____ Yes _____ No

How did you do this?

13. Do you now have a copy of a Soldier's Manual?

_____ Yes _____ No

Which one(s)?

Where did you get it (them) & who issued it (them)?

34. Have you ever received any help or instruction from your unit on how to use a Soldier's Manual?

_____ Yes _____ No

Was the help received from your unit:

() Very useful

() Somewhat useful

() Not very useful

How was the help provided to you and by whom?

35. Which of the following would best meet your needs?
(Check one.)

() To keep your own personal copies of Soldier's Manual(s) throughout your Army career.

() To get your own copies of Soldier's Manual(s) at each post when you arrive and turn them in when you leave.

() To have Soldier's Manuals available to you within your own unit for use whenever you want.

STOP. Wait for further instructions.

Column I

16. Have you ever used or tried to use a Soldier's Manual for any purpose since leaving AIT?

Yes

No

Go to Column II

Which Soldier's Manual have you used most often?

MOS / Skill Level

I don't remember which one I used most often.

17. Several factors may influence how easily the Soldier's Manual can be used. Rate the Soldier's Manual on the following factors:

a. Size: Too large - hard to carry

Too small - easy to misplace

OK

b. Bulk: Too heavy

Too thick

Too thin

OK

c. Binding:

SM comes apart too easily

SM pages don't lie flat - hard to use

OK

d. Print:

Too hard to read - print too small

Too hard to read - lines too close together

OK

Continue Column I next page.

Column II

Why not?

STOP. Wait for further instructions.

Column I

Column II

17. (continued)

e. Pictures & Diagrams:

None but should have them

Not enough

Too many

Not clear & understandable

f. Are there any other problems with the size, shape, weight, etc., of the Soldier's Manual that make it difficult to use?

Yes

No

Please explain:

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18. Is the general purpose of your Soldier's Manual clearly stated?

a. Yes

Comment?

b. For the most part

c. No

d. I don't know

Continue Column I next page.

Column 11

d. I don't know

d. I don't know

d. I don't know

e. None are

Continue Column 1 next page.

Column I

Are the words used in the SM easy to understand?

a. All are _____
Comment?

b. Most are _____

c. Some are _____

d. Few are _____

e. None are _____

i. The SM contains sections that describe the Test Situation, Test Conditions, Performance Measures, and Test Standards of each task.

a. Are those sections clear and specific?

_____ All are _____
Comment?

_____ Most are _____

_____ Some are _____

_____ Few are _____

_____ None are _____

_____ I don't know

b. Are those sections job related?

_____ All are _____
Comment?

_____ Most are _____

_____ Some are _____

_____ Few are _____

_____ None are _____

_____ I don't know

5. Does your SM tell you everything you need to know about how to perform the tasks listed in it?

Yes _____

No _____

If No:

What kind of information is missing from your SM?

Column II

Colman I I

RAY No. 44

W
RAY

Yes	No	Don't remember
------------	-----------	-----------------------

Yes _____ No _____ Don't remember _____

How useful is it? _____ Comment? _____

How useful is it?

{ } very useful

() Useful

() Not useful

a. Very often

b. often

c. A few lines

d. Once

e. Never

a. Yes _____ Comment? _____

а. уен

b. Most of the time

c. **Seldom**

d. Never

e. Never used them

Continue Column I next page.

Column I

Column II

50. How many of the tasks in the SM are critical or important for your MOS?

- a. All are
- b. Most are
- c. Few are
- d. None are
- e. Don't know

51. Are any important tasks for your MOS left out of the SM?

- a. Don't know
- b. No
- c. Yes

Which tasks can you name that were left out?

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52. How many of the tasks described in your SM are different from the way you usually do them on the job?

- a. All are different } Please give examples if you can:
- b. Most are different }
- c. A few are different }
- d. None of them are different
- e. Don't know

Have you found any technical errors in your SM?

- A lot
- A few
- None

Continue Column I next page.

Column I

54. Did you use the Soldier's Manual to study for the SQT?

Yes ☐ No ☐ Why didn't you use the SM to prepare for the SQT?

Was it helpful?

Yes ☐ No ☐ Why not?

About how many hours per week did you spend using the SM to prepare for the SQT?

_____ hours per week

When training for the SQT, how often did you use the SM?

_____ A lot (more than 50 times)

_____ Quite a bit (25-50 times)

_____ Some (10-25 times)

_____ Not very often (1-10 times)

About how many of these times did you:

Use the SM when asked to by your supervisor?

Most ☐ Some ☐ None ☐

Use the SM when time was scheduled for its use?

Most ☐ Some ☐ None ☐

Use the SM on your own & whenever you felt you needed it?

Most ☐ Some ☐ None ☐

Other. Please explain: _____

Continue Column I next page.

Column II

(Continue Column I next page.)

Column II

Yes _____ **No** _____

Yes No Some were & some were not.

Yes _____ **No** _____

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(Everyone answer Item #58.)

58. Listed below are resources which can be used for job training. Indicate whether or not you have used any of the listed items by checking the appropriate line.

Item	Used to Prepare for SQT	Used for Other Reasons	Did Not Use
Army Regulations (AR).....	_____	_____	_____
Army Circulars (DA CIR).....	_____	_____	_____
Army Pamphlets (DA PAM).....	_____	_____	_____
Field Manuals (FM).....	_____	_____	_____
Training Circulars (TC).....	_____	_____	_____
Technical Manuals (TM).....	_____	_____	_____
Training Films (TF).....	_____	_____	_____
Training Extension Course (TEC) Lessons.....	_____	_____	_____
Army Training Programs (ATPs).....	_____	_____	_____
Army Training & Evaluation Programs (ARTEPs).....	_____	_____	_____
Locally Developed Materials.....	_____	_____	_____
Co-Workers.....	_____	_____	_____
Supervisors.....	_____	_____	_____
Others: _____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Continue on next page.

(Everyone answer Item #59 and Item #60.)

59. How much importance is given to Individual Job Training in your unit?

- () Great importance. It is emphasized and given full support from higher level personnel.
- () It is important but it is not always given the support it needs.
- () It is not a very important activity and is often done on a "do the best you can" basis. There is little real support from the higher level personnel.
- () It is of very low importance. If it's done at all, it is done only when absolutely necessary.

60. Sometimes in a unit, Individual Job Training may be emphasized and at other times it may be ignored. Can you identify the times in your unit when Individual Job Training is emphasized more than others?

STOP. Wait for further instructions.

APPENDIX A-2

SENIOR LEVEL INTERVIEW

Instructions: The entire area of inquiry should be read or explained before seeking a response. You may then probe as needed to be sure you get a response to each of the sub-areas.

Introduction

We requested this interview as part of a study being carried out by the American Institutes for Research for the Army Research Institute. The study is designed to provide the Army with specific guidance on ways in which the EPMS system may be improved, with particular emphasis on the use and effectiveness of Soldiers' Manuals. We are obtaining information from approximately 2000 enlisted and officer personnel in the United States and in Europe. Twenty-five different MOSs are represented in the sample. We very much appreciate the time you have made available for this interview. I will take notes during the interview. The information you provide will be used for research purposes only and will not be attributed to you personally. It will become part of the body of information we receive from persons at your level of responsibility.

1. Name _____

Rank _____

Unit _____

Job Title _____

How long have you had this job? _____

What are your major job responsibilities?

Have you had a comparable job in other units? _____

If so, for how long? _____

Were your training responsibilities comparable? _____

Date _____

Interviewer _____

Site _____

2. Briefly describe your unit's training requirements and training resources. Are they well matched? Weaknesses/Problems?

3. How is training conducted and how is it managed?

4. How much training is provided by the unit and how much is the soldier expected to do on his or her own?

Unit:

Soldier:

What training programs do you provide for the soldier to do this?

5. Let's separate the mission of your unit in terms of Combat Arms and Support. Do you have both? (If both) Contrast the amount and quality of training received by the Combat Arms MOS with the training received by the Support MOS.

Combat Arms:

Support:

6. How would you describe the "climate" of individual training in your unit?

Is it supported and encouraged or neglected?
Should it be changed; how could it be changed? Why?

7. What is the nature of the workload generated by the EPMS system in general and the SM, SQT Notice, SQT system in particular?

Is it appropriate for the value received?
Is it excessive?
Could it be simplified or streamlined?

8. How relevant is individual job training in your unit as related to the typical soldier's:

Primary MOS

Duty position

Daily activities

SM/SQT tasks

9. What do your personnel do and what do they use to advance in skill level and grade-level? Be as specific as you can.

10. Do you provide, or is there provided, any formal or scheduled training in preparation for SQT?

What does it consist of?

Who does it?

Is it adequate or appropriate?

How would you improve it?

11. What is the flow of information once a soldier has taken an SQT?

How is the soldier informed of his scores?

Does he know what they mean?

Does the system work "as intended" and should it be changed?

12. (As appropriate)

Do you have any copies of the Commander's Manual?

Which ones?

Do you use it (them)?

How? For what purpose?

Are they useful?

Could they be improved in any way?

(If he or she doesn't have and use them, why not?)

13. (As appropriate)

Do you have any copies of Job Books?

Which ones?

Do you use it (them)?

How? For what purpose?

Are they useful?

Could they be improved in any way?

(If he or she doesn't have and use them, why not?)

This part of the interview focuses on the individual soldier's use of the Soldiers' Manual. We want to find out what you have observed about the use or non-use of the SMS among your soldiers.

14. How available are Soldiers' Manuals to soldiers?

How do they get them initially?

How are they distributed?

How can they replace lost ones or get ones for higher skill levels?

15. How do your soldiers use Soldiers' Manuals?

16. Do you note any patterns of SM usage among your personnel?

Do some personnel use them more than others?
Why do you think this is so?

17. Are the Soldiers' Manuals used more when the SQTs are announced? When the SQT Notices are distributed?

How does this impact on:

Patterns of use
Frequency of use

18. How useful do you think the SMS really are to the average soldier in your unit?

Are there other documents or materials that do the same job as well or better?
Are they used?

19. Do you think that users of SMS understand what they are and how they are supposed to be used? Let's consider:

Purpose
Locating information in it
Level of language used -- comprehension of content
Format
Other

20. Do you have any personal opinion about any of the above?

Purpose
Locating information in it
Level of language used -- comprehension of content
Format
Other

21. Is any formal or scheduled instruction given to soldiers on what the SM is and how to use it? If so, explain what, when, who, and where.

22. How accurate and complete are the SMs?

Do you know of any tasks that are omitted that should be in the SM?

Ones that are in the SM that should be omitted?

Errors in the information related to any task?

23. The physical characteristics of the SMS may affect their use. Have you heard any comments or seen anything that relates to the:

Size of the SMS (too big, too small, too long)?

Bulk of the SMS (too heavy, too unwieldy)?

Binding of the SMS (too tight, does not lie flat, comes apart)?

Other?

24. Do senior level people use Soldiers' Manuals?

Do you?
What for?

25. What changes would you recommend in:

The SMS per se -- as documents?

The SQTs?

The SQT Notices?

The scheduling of, and support given to, the entire
SQT system?

26. Have you ever been asked for your opinions on any of these
topics before? Explain.

27. Is there a feedback mechanism that you can use to convey your own experiences and comments about the SM/SQT system to others?

What is it?

Have you used it?

28. Any other comments you would like to make?

End of Interview

INSTRUCTIONS:

(If not.) Did you use or try to use the SM recently? (Refer to information from interview to stimulate response.)

(Write incident(s) in space(s) below. Try to get at least two incidents
Be sure to obtain all key information.

Incident #1:		Key Information
		[] Who (Name, Rank)
		[] Where
		[] When
		[] What happened
		[] Result

Interviewer Comments:

SPECIAL INTERVIEW ITEMS

(Check Item 20 to determine which question to ask.
If 20 is "No" or "Don't know" go to 1a; if "yes" go to 1b.)

1a. What do you have to do to get promoted?

1b. What is the normal way for a soldier to advance from one Skill Level to another Skill Level?
Be as specific and detailed as you can.

2. Does the Army provide you with any documents that are designed to help you move from one Skill Level to the next?

Yes

No

What documents does the Army provide?
Can you name any?

3. What are your own specific plans for advancement in your Primary MOS and how will you carry them out?

When do you plan to accomplish the things noted above?

What do the initials EPMS and SQT stand for? EPMS stands for _____
SQT stands for _____

APPENDIX A-5

CONFIDENCE RATING FORM

61. We need to know more about your ability to do various tasks in your Primary MOS and at your Skill Level. For each of the tasks given on the attached pages, we want you to do three things:
- (1) Check whether or not you have ever been trained for the task.
 - (2) Check whether you have performed the task since joining your unit.
 - (3) Check how confident you would be in doing the task, even if you have not performed it.
- Below is an example for MOS 63H, Automotive Repairman.

TASK	CONFIDENCE RATINGS				SELF CONFIDENCE IN PERFORMING TASK (check 1/2 sum)				
	Trained to do task		Performed last 100 days on job		A	B	C	D	E
	Yes	No	Yes	No	Can't do it	Can do it, but not very well	Can do it fairly well	Can do it well	Can do it very well
Remove and Replace the Service Brake Assembly on 1 1/2 Ton Truck M561									
Replace 2 1/2 Ton Truck M35A2 Transmission									

On the first task, the soldier indicates that he or she has not been trained to do it, has not performed it, and that he or she can do it, but not very well (checked Column B). For the second task, the soldier has been trained, has performed it, and has checked Column E, meaning that he or she is very confident in being able to replace the transmission.

On the following pages evaluate your ability to do some of the tasks for your MOS & Skill Level. We have not included all tasks due to time and space limitations.

We are using Column D, "Can do it well," to mean the same as "Being able to pass the SQRT for that task." Even if you have not been trained and have not performed the task, we still want you to give a confidence rating.

Remember, your answers will be used for research purposes only and will be held in strict confidence. Please be as accurate as you can in completing this information. Before you begin, are there any questions?

NAME _____

Signal System Maintenance
(continued)

CONTINUED

SEE COMMENTS IN
THIS COLUMN TASK
check (✓) item

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

TASK

- Select a Chaparral Position
- Command Squad During Target Engagement
- Conduct Chaparral Squad Drills
- Supervise Chaparral Missile Misfire/Range Fire Procedures
- Supervise Troubleshooting Procedures on Chaparral Carrier
- Perform Preventive Maintenance Checks & Services on the Chaparral Launch Station (MS4)
- Supervise Preventive Maintenance Checks & Services on Chaparral Carrier
- Load & Unload the Chaparral Missile
- Perform Chaparral Squad Drill
- Perform Chaparral Launch Station for Helicopter Travel
- Supervise Operation & Operator Maintenance of Target Alert Data Display Set (TADMS)
- Perform Duties as Commander of the Relief

.....

CONJUNCTION

[illegible][illegible]**Install, Operate, & Maintain Field Telephone TA-312/PT**

Visually Recognize Aircraft

Perform Assembly & Disassembly of the M16A1 Rifle or M1911A1 Automatic Pistol

Distinguish between Threat & Friendly vehicles

Perform Troubleshooting Procedures on Chaparral Carrier

Perform Chaparral Missile Missfire/Noangfire Procedures

Qualify with an M16A1 Rifle or M19A1 Caliber .45 Pistol

Perform Water-Crossing Operations

Operate the Chaparral Carrier Under Unusual Conditions

Operate the Chaparral Launch Station Under Unusual Conditions

energize & energize the Chaparral launch station (M54)

Supervise Occupation & Improvement of a Chaparral Position

APPENDIX B-1

Summary of Regression for SQT Raw Score

<u>Predictor Sets</u>	<u>df</u>	<u>SS</u>	<u>R²</u>
Full model (all variables)	63	144664.500	.5828
Study Group	9	20983.566	.0845
Rank	5	18329.734	.0738
MOS	22	112229.406	.4521
Study Group and Rank	14	32955.289	.1328
Study Group and MOS	31	118008.469	.4754
Rank and MOS	27	117810.844	.4746
Usage Index	1	25958.852	.1046
Usage Index and MOS	23	116761.547	.4704
Usage Index, MOS, Study Group and Rank	37	123821.109	.4988
ERROR (full model)	586	103549.703	

Summary of Regression for SQT Written Score

<u>Predictor Sets</u>	<u>df</u>	<u>SS</u>	<u>R²</u>
Full model (all variables)	63	16.320	.5635
Study Group	9	1.716	.0593
Rank	5	2.979	.1028
MOS	22	12.493	.4314
Study Group and Rank	14	3.993	.1379
Study Group and MOS	31	13.075	.4514
Rank and MOS	27	13.519	.4668
Usage Index	1	2.274	.0785
Usage Index and MOS	23	12.969	.4478
Usage Index, MOS, Study Group and Rank	37	14.027	.4843
ERROR (full model)	586	12.642	

APPENDIX B-3

Summary of Regression for SQT Hands-On Score

<u>Predictor Sets</u>	<u>df</u>	<u>SS</u>	<u>R²</u>
Full model (all variables)	49	7.323	.3973
Study Group	9	0.325	.0176
Rank	5	0.087	.0047
MOS	11	2.792	.1515
Study Group and Rank	14	.387	.0210
Study Group and MOS	20	3.537	.1919
Rank and MOS	16	2.963	.1608
ERROR (full model)	357	11.107	

Summary of Regression for Confidence Ratings

<u>Predictor Sets</u>	<u>df</u>	<u>SS</u>	<u>R²</u>
Full model (all variables)	68	310.557	.4032
Study Group	9	62.042	.0805
Rank	6	56.912	.0739
MOS	25	227.070	.2948
Study Group and Rank	15	88.530	.1149
Study Group and MOS	34	235.734	.3060
Rank and MOS	31	249.869	.3244
Usage Index	1	88.448	.1148
Usage Index and MOS	26	245.720	.3190
Usage Index, MOS, Study Group and Rank	41	263.328	.3419
ERROR (full model)	946	459.705	

Soldiers' Knowledge of EPMS

One of the purposes of the Soldier Interview segment of the survey was to get a general idea concerning how much the typical soldier knows about the Enlisted Personnel Management System (EPMS). Project staff asked soldiers several questions about the EPMS, and attempted to elicit information regarding specific and general knowledge of what the system is and how it works.

As to "specific" information, soldiers were asked if they knew what the acronyms "EPMS" and "SQT" stood for. Of the 353 soldiers interviewed, only 82 (23.2%) knew the correct answer for "EPMS"; 249 (81.9%) knew what "SQT" meant, on a more descriptive level, soldiers were asked to specify the requirements for promotion from one pay grade to the next. Only 19.3% of the sample mentioned anything about the EPMS, SQT, or any other test; the majority of the responses were of the "don't get into trouble, do your job" type.

One final issue discussed during the interview was the resources provided by the Army to assist in promotion and progress through the EPMS. The following table shows, for different types of documents, the frequency and proportion of soldiers who mentioned them. (Soldiers could have mentioned more than one document.)

<u>Document</u>	<u>N</u>	<u>Percentage</u>
Soldier's Manual	141	39.9%
SQT Notice	70	19.8%
TM or FM	98	27.8%
TEC Lessons	35	9.9%
Correspondence Course	48	13.6%
Letters of Appreciation or Merit	5	1.4%

Training Resources

As part of both the Questionnaire and Soldier Interview group surveys, soldiers were asked to respond to the following question:

"Listed below are resources which can be used for job training. Indicate whether or not you have used any of the listed items by checking the appropriate line."

Results are as follows (entries are percentages of soldiers who checked each line):

Item	Used to Prepare for SQT	Used For Other Reasons	Both	Did Not Use
Army Regulations (AR)	9.3	13.5	46.6	30.6
Army Circulars (DA CIR)	7.0	5.1	35.6	52.3
Army Pamphlets (DA PAM)	11.1	12.1	42.2	34.7
Field Manuals (FM)	27.3	27.6	27.4	17.7
Training Circulars (TC)	14.5	11.2	26.1	48.2
Technical Manuals (TM)	24.9	24.4	29.7	21.0
Training Films (TF)	25.9	17.9	26.8	29.4
Training Extension Course (TEC) Lessons	20.5	14.5	18.1	46.9
Army Training Programs (ATPs)	9.5	5.6	25.1	59.8
Army Training & Evaluation Programs (ARTEPs)	12.9	11.5	33.0	42.6
Locally Developed Materials	15.6	8.5	24.2	51.7
Co-Workers	25.1	20.7	23.6	30.6
Supervisors	26.2	22.3	25.4	26.1

Note that entries in the "Both" column are percentages of respondents who used the particular resource for both SQT preparation and for other reasons. Thus, for example, a total of 55.9% (9.3% + 46.6%) of the sample used Army Regulations to prepare for the SQT and 60.1% (13.5% + 46.6%) used them for other reasons. In this light, Army Regulations are the most used documents for SQT preparation, followed by Field Manuals (54.7%), Technical Manuals (54.6%), and Army Pamphlets (53.5%).